Vol. 984 Number 2

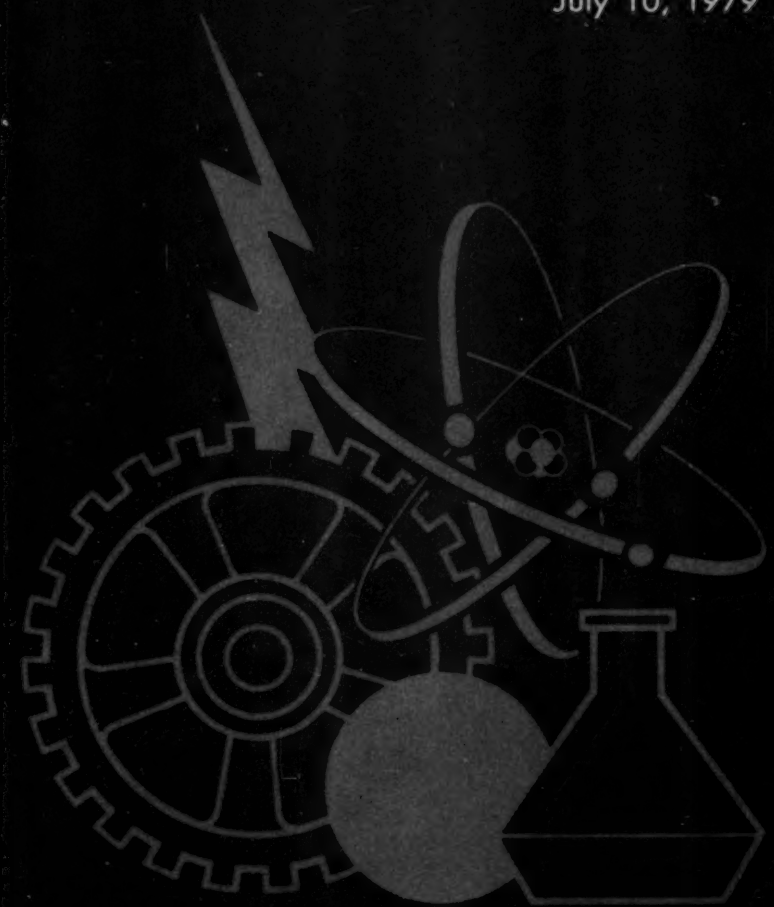
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 10, 1979



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 10, 1979 Volume 984 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before July 31, 1979.

Beasley, Bernard, 451 Ridout St., North London, Ontario, Canada

Blunk, Evon C., 8701 Highgate Rd., Alexandria, Va. 22308

Claffy, Kathleen H., 2301 Jefferson Davis Hwy., No. 722, Arlington, Va. 22202

Gorenstein, Charles, 26 Goodport Lane, Gaithersburg, Md. 20760

Reynolds, David D., 1600 S. Eads St., No. 203N, Arlington, Va. 22202

Ross, Thomas I., 5100 Marine Dr., No. 21G, Chicago, Ill. 60604

Shannon, John P., Jr., 30 E. Chapman St., Alexandria, Va. 22301

Sprague, Kenneth W., 6619 Lone Oak Dr., Bethesda, Md. 20034

June 12, 1979. LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,019,334, Re. S.N. 033,650, Filed Apr. 26, 1979, Cl. 405/169, METHOD AND APPARATUS FOR MAKING SUBSEA PIPE CONNECTIONS, Albert R. Sinclair, et al., Owner of Record: *Exxon Production Research Company, Houston, Tex.,* Attorney or Agent: John S. Schneider, et al., Ex. Gp.: 351

4,049,158, Re. S.N. 034,329, Filed Apr. 30, 1979, Cl. 222/95, PRESSURIZED CONTAINER-DISPENSERS AND FILING METHOD, Vincent Lo, et al., Owner of Record: *S. C. Johnson & Son, Inc., Racine, Wis.,* Attorney or Agent: Joseph T. Kinlin, Jr., et al., Ex. Gp.: 311

4,122,681, Re. S.N. 035,622, Filed May 3, 1979, Cl. 405/261, MINE ROOF SUPPORT METHOD AND ASSEMBLY, George S. Vass, et al., Owner of Record: *The Eastern Company, Naugatuck, Conn.,* Attorney or Agent: Charles S. McGuire, Ex. Gp.: 351

4,124,301, Re. S.N. 035,381, Filed May 2, 1979, Cl. 356/432, DEVICE FOR MEASURING LIGHT TRANSMITTED THROUGH A MATERIAL, Sydney Norman Pocock, Owner of Record: *National Research Development Corporation, London, England,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 257

4,135,424, Re. S.N. 034,925, Filed Apr. 25, 1979, Cl. 84/1.13, VARIABLE FUNCTION GENERATOR, Shimaji Okamoto, Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-Ken, Japan,* Attorney or Agent: James R. Longacre, et al., Ex. Gp.: 217

PATENT NOTICES

Certificates of Correction for the Week of July 10, 1979

Re. 29,857	4,098,658	4,133,912	4,141,480
Re. 29,934	4,100,602	4,134,189	4,141,501
D. 249,019	4,101,913	4,134,574	4,141,736
D. 251,696	4,102,938	4,134,966	4,142,005
3,451,352	4,105,335	4,135,929	4,142,037
3,889,189	4,107,218	4,135,930	4,142,216
3,904,657	4,107,297	4,136,006	4,142,409
3,955,947	4,109,084	4,136,085	4,142,523
3,956,292	4,110,029	4,136,099	4,142,533
4,016,054	4,111,141	4,136,128	4,142,827
4,020,651	4,111,619	4,136,208	4,142,943
4,020,713	4,112,032	4,136,837	4,143,084
4,021,457	4,114,229	4,137,146	4,143,257
4,023,092	4,117,786	4,137,151	4,143,288
4 025,642	4,118,237	4,137,154	4,143,616
4,036,478	4,118,396	4,137,460	4,144,209
4,041,181	4,118,492	4,137,826	4,145,279
4,051,079	4,119,753	4,138,080	4,145,889
4,051,307	4,120,816	4,138,275	4,146,221
4,053,352	4,121,056	4,138,287	4,146,469
4,057,260	4,121,291	4,138,326	4,146,543
4,058,676	4,122,876	4,138,420	4,147,618
4,062,703	4,123,765	4,138,472	4,148,144
4,064,255	4,123,779	4,138,505	4,148,717
4,066,665	4,124,817	4,138,731	4,148,847
4,071,187	4,127,320	4,138,764	4,148,884
4,075,618	4,127,381	4,139,038	4,149,369
4,077,528	4,127,569	4,139,234	4,149,414
4,077,610	4,127,579	4,139,340	4,149,499
4,077,687	4,127,631	4,139,417	4,149,756
4,078,145	4,127,706	4,139,577	4,150,722
4,080,051	4,128,701	4,139,712	4,150,874
4,083,977	4,129,727	4,139,821	4,151,012
4,084,203	4,130,563	4,139,931	4,151,580
4,086,188	4,130,901	4,140,118	4,151,708
4,088,464	4,131,411	4,140,490	4,152,521
4,088,645	4,132,724	4,140,518	4,152,758
4,089,587	4,133,467	4,140,523	4,153,392
4,089,972	4,133,559	4,141,169	4,153,478
4,093,815	4,133,747	4,141,232	
4,097,603	4,133,807	4,141,380	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,061,998, G. Bloch, BULKED CONTINUOUS FILAMENT YARNS, Interference No. 95,927, decided July 31, 1972, claims 1, 2 and 3.

Patent No. 3,578,819, T. M. Atkins, SKID CONTROL SYSTEM, Interference No. 98,683, decided Jan. 15, 1979, claims 11, 12 and 21–26.

Patent No. 3,883,218, R. J. Slaughter, OPTICAL GUIDES, Interference No. 99,492, decided Feb. 8, 1979, claim 1.

Patent No. 3,896,137, C. A. Balle, P. E. Bender and B. Loev, 8-ALKYL AND ALKENYL-10-HYDROXY-5H[1] BENZOPYRANOPYRIDINE DERIVATIVES AND USES THEREOF, Interference No. 99,586, decided Mar. 21, 1978, claim 1.

Patent No. 3,935,424, T. L. Donnelly and E. J. Mullen, FLASH FUSING APPARATUS, Interference No. 99,419, decided Oct. 24, 1978, claims 1 and 2.

Patent No. 3,940,158, H. Wehrli, SKI BRAKE, Interference No. 99,921, decided Mar. 13, 1979, claims 1, 2, 3 and 6.

Patent No. 3,978,478, L. S. Schmitz, RESET CIRCUIT FOR A SECURITY SYSTEM, Interference No. 99,820, decided Mar. 27, 1979, claims 1 and 3.

Patent No. 3,984,126, G. W. Goetz and R. G. Gehrig, INFLATOR FOR VEHICLE OCCUPANT RESTRAINT SYSTEM, Interference No. 99,971, decided Mar. 20, 1979, claims 1–4, 9–15, 18 and 19.

Patent No. 4,013,320, P. E. Hugin, MULTIPLE PLATE ASSEMBLY FOR FORMING ELECTRICAL CONNECTOR OR SWITCH, Interference No. 99,790, decided Mar. 13, 1979, claims 1, 3, 7, 9 and 12.

Patent No. 4,015,390, R. Howorth, GLAZING STRUCTURES, Interference No. 100,038, decided Mar. 15, 1979, claims 1 and 3.

Patent No. 4,018,865, L. V. Gallacher, SOLVENT-EXTRACTION PROCESS FOR RECOVERY AND SEPARATION OF METAL VALUES, Interference No. 99,868, decided Mar. 15, 1979, claims 1–4, 5, 7–9, 11, 12, 20 and 21.

Patent No. 4,024,976, D. D. Acton, TAMPERPROOF MOLDED PACKAGE, Interference No. 99,832, decided Mar. 14, 1979, claims 36–53.

Disclaimers

Design No. 236,682.—*La Verne E. Clayton,* Rockford, Ill. ESCUTCHEON. Patent dated Sept. 9, 1975. Disclaimer filed May 10, 1979, by the assignee, *Amerock Corporation.*

Hereby disclaims said claim of said patent.

3,211,035.—*Lawrence V. Whistler, Sr.* and *Lawrence V. Whistler, Jr.,* Kenmore, N.Y. PUNCH STRIPPER APPARATUS. Patent dated Oct. 12, 1965. Disclaimer filed Apr. 27, 1979, by the inventors.

Hereby enters this disclaimer to claims 1, 2, 3 and 14 of said patent.

3,622,624.—*Yael Arad,* Tel Aviv and *Moshe Levy* and *David Vofsi,* Rehovot, Israel. PROCESS FOR THE PRODUCTION OF ADIPIC ACID. Patent dated Nov. 23, 1971. Disclaimer filed May 24, 1979, by the assignee, *U.C.B., Societe Anonyme.*

Hereby enters this disclaimer to all claims of said patent.

4,017,759.—*Donald E. Miller,* Asbury, N.J. DISPLAY PANEL FOR DISPLAYING A BAR OF LIGHT. Patent dated Apr. 12, 1977. Disclaimer filed May 31, 1979, by the assignee, *Burroughs Corporation.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,132,656.—*Donald L. De Vries,* South Holland and *James M. De Jovine,* Homewood, Ill. SOLID PARTICLES CONTAINING LUBRICATING OIL COMPOSITION AND METHOD FOR USING SAME. Patent dated Jan. 2, 1979. Disclaimer filed May 21, 1979, by the assignee, *Atlantic Richfield Company.*

The term of this patent subsequent to June 13, 1995, has been disclaimed.

4,134,844.—*Donald L. De Vries,* South Holland and *James M. De Jovine,* Homewood, Ill. SOLID PARTICLES CONTAINING LUBRICATING OIL COMPOSITION AND METHOD FOR USING SAME. Patent dated Jan. 16, 1979. Disclaimer filed May 21, 1979, by the assignee, *Atlantic Richfield Company.*

The term of the patent subsequent to June 13, 1995, has been disclaimed.

4,088,639.—*Piergiorgio Zappelli,* Monterotondo, *Luciano Re,* Rome, and *Walter Marconi,* San Donato Milanese, Italy. MACROMOLECULAR ADENINE NUCLEOTIDE DERIVATIVES. Patent dated May 9, 1978. Disclaimer filed May 30, 1979, by the assignee, *Hudson Pulp & Paper Corp.*

Hereby enters this disclaimer to claim 4 of said patent.

3,649,666.—*Yael Arad*, Tel Aviv and *Moshe Levy, Israel R. Miller*, and *David Vofsi*, Rehovoth, Israel. PROCESS FOR THE HYDRODIMERIZATION OF ACRYLIC ACID DERIVATIVES. Patent dated Mar. 14, 1972. Disclaimer filed May 24, 1979, by the assignee, *U.C.B., Societe Anonyme.*

Hereby enters this disclaimer to all claims of said patent.

3,686,269.—*Yael Arad* and *Moshe Levy*, Tel Aviv, and *David Vofsi*, Rehovoth, Israel. PROCESS FOR THE HYDRODIMERIZATION OF ACRYLIC ACID DERIVATIVES. Patent dated Aug. 22, 1972. Disclaimer filed May 24, 1979, by the assignee, *U.C.B., Societe Anonyme.*

Hereby enters this disclaimer to all claims of said patent.

3,686,270.—*Yael Arad*, Tel Aviv and *Moshe Levy* and *David Vofsi*, Rehovoth, Israel. PROCESS FOR THE HYDRODIMERIZATION OF ACRYLIC ACID DERIVATIVES. Patent dated Aug. 22, 1972. Disclaimer filed May 24, 1979, by the assignee, *U.C.B., Societe Anonyme.*

Hereby enters this disclaimer to all claims of said patent.

3,732,276.—*Cyrille Van Eygen*, Boitsfort and *Antonin Hendrickx*, Brussels, Belgium. HYDRODIMERIZATION PROCESS OF ACRYLIC COMPOUNDS. Patent dated May 8, 1973. Disclaimer filed May 24, 1979, by the assignee, *U.C.B., Societe Anonyme.*

Hereby enters this disclaimer to all claims of said patent.

3,982,140.—*George C. Lockwood*, Dayton, Ohio. HIGH SPEED BISTABLE MULTIVIBRATOR CIRCUIT. Patent dated Sept. 21, 1976. Disclaimer filed May 9, 1979, by the assignee, *NCR Corporation.*

Hereby enters this disclaimer to all claims of said patent.

4,149,389.—*Floyd C. Hayes*, Onalaska and *Merle A. Renaud* and *Paul R. Glamm*, La Crosse, Wis. HEAT PUMP SYSTEM SELECTIVELY OPERABLE IN A CASCADE MODE AND METHOD OF OPERATION. Patent dated Apr. 17, 1979. Disclaimer filed May 18, 1979, by the assignee, *The Trane Company.*

Hereby enter this disclaimer to claims 1–3, 6–12, 22 and 23 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,558 to 3,031,668, inclusive
Plant Patents..... Numbers 2,135 to 2,142, inclusive

REISSUES

JULY 10, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,042

EXHAUST SYSTEM CONNECTOR SEAL

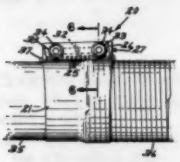
John R. Hiemstra, Rosemount, and Wayne M. Wagner, Apple Valley, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Original No. 3,944,265, dated Mar. 16, 1976, Ser. No. 524,061, Nov. 15, 1974. Application for reissue Apr. 7, 1977, Ser. No. 785,755

Int. Cl.[2] F16L *21/06*

U.S. Cl. 285—419 19 Claims

1. The method of joining two substantially incompressible tubular members axially which comprises bending a flat band of ductile metal around the adjacent ends of the members in direct superficial contact with said members and circumferentially stressing the band beyond its elastic limit to cause it to conform to the surfaces of the members throughout substantially their entire circumference the ductile metal band being such that it yields before the material of said member.



PLANT PATENTS

GRANTED JULY 10, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,432
STRAWBERRY PLANT

Andre Marionnet, Soings en Sologne, France, assignor to Jeanne Marionnet-Rabier, Mur de Sologne, France

Filed Jun. 9, 1977, Ser. No. 805,246
Int. Cl.[2] A01H *5/08*
U.S. Cl. Plt.—49 **1 Claim**

1. A new and distinct variety of strawberry plant substantially as herein shown and described, characterized by the fact that it is an everbearing and very productive variety with the particularity of not producing any stolons.

4,433
AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA", Isselburg, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,050
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Minnesota and characterized by the combined features of large-star-shaped, non-dropping red-purple flowers, strong upright flower stems, with 5–7 flowers on each stem and 10–12 stems on each plant, dark green leaves, and vigorous growth habit.

4,434
POINSETTIA PLANT

Alexander Hrebeniuk, 7 Corner Rd., Perkasie, Pa. 18944

Filed Apr. 5, 1978, Ser. No. 893,758
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant substantially as illustrated and described, characterized particularly as to novelty by its compact growth, self-branching habit, non-drooping foliage, and its ability to maintain its beauty and life at a temperature range of 50° F. to 60° F.

4,435
NECTARINE TREE (43-G-587)

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Aug. 17, 1978, Ser. No. 934,542
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, particularly characterized by fruit having a ripening period between the Aurelio Grand and May Grand; the fruit being of a firmness which permits long distance shipping and provides a substantial shelf life.

4,436
CHERRY TREE

Marvin L. Nies, 9296 E. Kettleman La., Lodi, Calif. 95240

Filed Sep. 5, 1978, Ser. No. 939,900
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—37 **1 Claim**

1. A new and distinct variety of cherry tree, substantially as illustrated and described, characterized, in particular, by large to medium size fruit which is crack-resistant, sizes well, is borne heavily and regularly on relatively short stems, is uniform in size and ripens evenly with the ripening period shortly after Burlat but before Larian and Bing, is firmer with darker red flesh than Larian but softer than Bing, is sweet flavored, and is of an attractive glassy red exterior color; the fruit, in shape, generally resembling the Bing but is slightly more round in cross section and not quite as flattened on the ventral side.

PATENTS

GRANTED JUL. 10, 1979

ERRATA

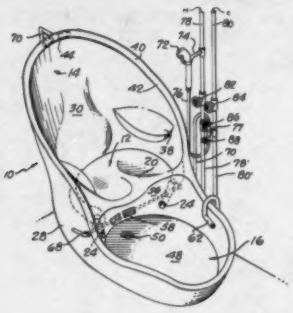
For CLASS	See PATENT NO.
091–483	4,160,404
414–749	4,160,507
414–004	4,160,508
414–607	4,160,509
406–098	4,160,567
422–106	4,160,647
435–101	4,160,695
435–025	4,160,696
435–194	4,160,697
435–173	4,160,698
435–287	4,160,699
435–298	4,160,670
209–152	4,160,711
585–475	4,160,788
525–411	4,160,789
525–179	4,160,790
525–469	4,160,791
525–148	4,160,792
525–230	4,160,793
128–607	4,160,854
350–120	4,160,942
361–388	4,161,016
361–412	4,161,017

PATENTS

GRANTED JULY 10, 1979

GENERAL AND MECHANICAL

4,160,292
BATH CHAIR
Christian L. Kuether, 1516 Oakdale, Houston, Tex. 77004, and Edith L. Kuether, 3708 Stewart Dr., Chevy Chase, Md. 20015
Continuation of Ser. No. 800,024, May 24, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,358
Int. Cl.[2] A47K *3/022*
U.S. Cl. 4—146 **19 Claims**



1. A bath chair, particularly for invalids, comprising: a substantially horizontal seat; a semicylindrical wall extending upwardly with respect to said seat for closely surrounding the back and sides of an invalid, the upper edge of said semi-cylindrical wall lying in plane inclined downwardly and forwardly to the level of said seat and said edge being curled forwardly and inwardly to form a channel with an inturned lip; a spray tube having openings in its bottom seated in said channel for directing water downwardly along the back and lateral surfaces of the body and the arms and thighs of an invalid seated in the chair; a deep well reservoir formed around and below said seat and separating said seat from the semi-cylindrical wall; a shallow foot pan disposed below and forward of the seat and having a rim whose rear portion is extended upwardly adjacent to the front of the seat, the forward edge of said rim being well below the level of said seat; a drain opening in said foot pan; a drain passage leading from said deep well reservoir to said foot pan, a valve in said passage; and means for supplying wash water independently to said spray tube and foot pan.

4,160,293
DRAIN VALVE ASSEMBLY
James E. Niemann, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Continuation of Ser. No. 766,167, Feb. 7, 1977, abandoned. This application Apr. 20, 1978, Ser. No. 898,005
Int. Cl.[2] E03C *1/262*
U.S. Cl. 4—295 **5 Claims**

1. A drain valve assembly of the finger lift type for mounting in a drain port of a plumbing fixture, said assembly consisting essentially of:

a unitary drain sleeve for mounting in the drain port of a plumbing fixture and a stopper mounted in said drain sleeve and being shiftable to an open and closed position in said sleeve;

said unitary drain sleeve having an open outer end and an open inner end for the passage of waste therethrough;

a radially extending flange integrally formed around the open outer end of said sleeve;

a beveled surface provides valve seat formed at the junction of the flange and said open outer end of said sleeve;

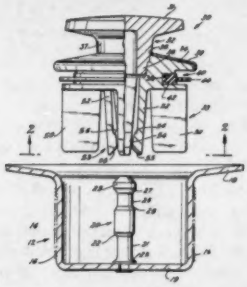
a screen integrally formed with said drain sleeve and disposed across the open inner end of said sleeve;

an elongated stud fixedly positioned in axial relation within said sleeve along the longitudinal axis thereof and mounted on said screen in fixed position;

said stud having a height measured from its mounting location on said screen and extending to the lower edge of said beveled surface which surface forms said valve seat;

stop means formed adjacent each end of said stud;

said stud including spaced upper and lower symmetrical annular rings having corresponding beveled surfaces which function alternately as camming surfaces when said stopper is shifted to its opened and closed positions and as stop means when said stopper is in its opened or closed position;



said stopper removably mounted on said stud and having gripping means for cooperating with said stop means for holding said stopper in a raised or opened position to permit waste water to drain from said plumbing fixture and a closed or lowered position;

said gripping means including a plurality of elongated spaced, circumferentially disposed, inwardly tapered fingers, the ends of said fingers having converging beveled surfaces extending radially inwardly which, when mounted on said stud, form a sliding frictional grip when said stopper is shifted alternately from a closed to an open position; and

a resilient seal means mounted on said stopper and extending radially therefrom for mating with said valve seat at said outer end of said drain sleeve in fluid tight relation when said stopper is shifted to its closed or lowered position.

4,160,294
TWO-STAGE FLUSH MECHANISM FOR TOILETS
John T. Crumby, Tri-County Blvd., Oliver Springs, Tenn. 38740
Filed Oct. 14, 1977, Ser. No. 842,336
Int. Cl.[2] E03D *1/14, 1/33*
U.S. Cl. 4—324 **5 Claims**

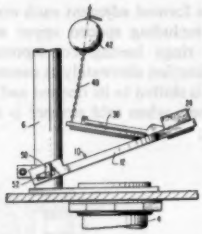
1. A flush valve assembly for controlling the flow of water from a storage tank to a toilet bowl through a discharge pipe opening at its upper end into the tank through its open upper end in order to selectively produce a larger or a smaller flow of water from the tank to the bowl, comprising:

a. an open frame adapted to be pivotally supported with respect to and adjacent the upper end of the discharge pipe within the tank, the frame being formed by side arms which are constructed and adapted to be positioned on opposite sides of the upper end of the discharge pipe and spaced therefrom,

b. a first float carried by the frame at a location remote from the pivoted support of the frame,

c. a single flap valve for controlling passage of water from the tank into the upper end of the discharge pipe, the valve being pivotally mounted on the frame at a location adjacent the position remote from the pivotal support of the frame said flap valve extending through said frame member for direct engagement with the discharge pipe,

d. means on the flap valve and the frame for limiting upward pivotal movement of the flap valve, with respect to the frame,



e. a strand connected at its lower end to the flap valve at a point remote from the pivotal support of the flap valve on the frame and extending upwardly therefrom for connection at its upper end to an operating lever for the toilet,

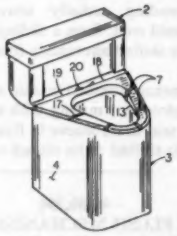
f. a second float adjustably connected to the strand between its ends with the pivotal support for the frame member to provide a yieldable detent feel to the user when the frame member is pivoted after the flap valve has pivoted to its upward limit of pivotal movement with respect to the frame.

4,160,295

TOILET SHROUD

Donald J. Putyra, 659 Chapman Dr., Corte Madera, Calif. 94925

Filed Dec. 23, 1977, Ser. No. 863,872
Int. Cl.[2] E03D *11/02*
U.S. Cl. 4—420 **1 Claim**



1. A toilet shroud comprising:

a. an elongated flexible washable material having an outer surface selected to present an aesthetic appearance and dimensioned to substantially cover the portion of a toilet between the floor and the rim of the bowl;

b. re-useable attachment means including a grip portion to removably attach said material to said attachment means and a hook portion to attach said means to said toilet;

c. said grip portion of said attachment means includes a U-shaped portion dimensioned to hold a portion of said flexible material;

d. said flexible material is folded and tacked along one edge to form a loop for receiving the U-shaped portion of said attachment means;

e. said hook portion of said attachment means includes a J-shaped portion adapted for attachment to the inner edge of a toilet bowl; and

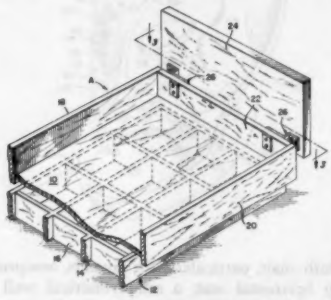
f. said attachment means is formed from a washable material having sufficient rigidity to support said elongated flexible material and sufficient resiliency so that said J-shaped portion can be sprung outwardly as it is forced over said toilet bowl rim and so that it will automatically return to its original shape or nearly so to cling tightly to said rim.

4,160,296

WATERBED HEADBOARD BRACKET

Isaac Fogel, Silver Spring, Md., assignor to Classic Products Corporation, Beltsville, Md.

Filed Feb. 23, 1978, Ser. No. 880,472
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—285 **5 Claims**



1. A waterbed headboard bracket for supporting a headboard comprising:

an elongated member having a first right angle bend and a second right angle bend forming a first leg and a second leg integrally joined by a transverse element;

a first pair of elongated slots in said first leg;

a second pair of elongated slots in said second leg; and

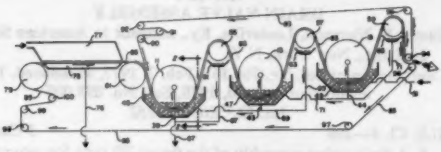
reinforcement means on the inside of said first right angle bend and said second right angle bend.

4,160,297

PULP WASHER

Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Nov. 21, 1977, Ser. No. 853,068
Int. Cl.[2] D06B *3/02*
U.S. Cl. 8—156 **11 Claims**



1. A machine for washing paper stock pulp and similar free filtering materials comprising:

(a) two or more horizontally-disposed wash drums each having a sidewall through which liquid can pass and end closure walls, said wash drums being mounted for rotation about their horizontal axes and disposed in side-by-side, vertically-stepped relationship with the first of said drums being the lowest and the last being the highest;

(b) two or more open tanks mounted to encompass the lower half or less of respective ones of said wash drums, said tanks being constructed to contain liquid exterior to said wash drums;

(c) roller members mounted for rotation at spaced-apart locations above each of said wash drums;
(d) first and second endless filter belts trained to pass under each of said wash drums and over each of said roller members in face-to-face relationship with each other to hold a mat of material to be washed;
(e) a first set of guide means mounted above said wash drums to guide said first endless filter belt from the last of said wash drums to the first of said wash drums, and a second set of guide means mounted below said wash drums to guide said second endless filter belt from the last of said wash drums to the first of said wash drums;
(f) drive means mounted to drive said first and second endless belts;
(g) liquid inlet means to introduce liquid into said wash tank associated with the highest of said wash drums; and
(h) syphon means connected in communication with each of said wash drums to draw liquid from the interiors of said drums to provide a hydrostatic head differential between the interiors of said wash drums and the liquid contents of the associated said tanks thereby to force liquid through the material held between said first and second endless belts.

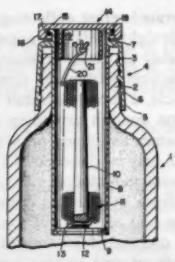
11. In a machine including two or more wash drums mounted in associated open tanks which contain liquid exterior of the wash drums, which drums have perforated sidewalls and are arranged in vertically-stepped relationship to one another, the first drum being the lowest and the last drum being the highest, a method of washing paper stock pulp and like free-filtering materials comprising:
a. training a pair of endless filter belts in face-to-face relationship to pass under each of said filter drums;
b. forming a mat of the material between the two belts;
c. driving the two belts to carry the mat of material under each of the drums from the first to the last;
d. introducing liquid into the interior of the tank associated with the last said drum to flow through the mat of material and then through the perforated sidewall of that drum and then into the drum, whereby the pulp mat is washed by the liquid;
e. conveying without pumping, the once-used liquid from the interior of the last drum to the tank associated with a lower drum;
f. removing the washed mat of pulp from between the two belts after the belts have passed under the last drum; and,
g. removing the liquid from the first drum.

4,160,298

CAPSULE FOR A LIFE SAVING LINE AND FLOAT

Al DeShano, 3693 Scott Ave., Shandon, Ohio 45063

Filed Feb. 22, 1978, Ser. No. 880,049
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—14 **10 Claims**



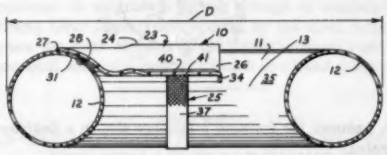
1. A life saving capsule for storing a life saving line within a standard container and thereafter dispensing the line when the container sealed by a portion of the capsule is thrown to a person within open water, said capsule being a replacement cap for a standard product container, said capsule including:
an annular threaded portion for a telescopic threaded engagement with the neck of the container;
a line holder releasably attached to said annular portion;
a fixed length of line having one end secured to said line holder and its opposite end secured by said annular portion to said container;
means to be held within said container by said annular portion for storing the line in an easily dispensable condition immediate its ends within the container;
means sealing the neck of the container when the annular portion is in tight threaded engagement with the neck of the container with the line holder removed and permitting dispensing of the full length of line between the line holder and container as the container is thrown across open water from a position where the line holder is retained.

4,160,299

UNITARY SEAT FOR INNER TUBE FLOAT

Tom Hilbern, Spokane, Wash., assignor to Melcher Manufacturing Co., Inc., Spokane, Wash.

Filed Nov. 16, 1977, Ser. No. 852,109
Int. Cl.[2] B63C *9/08*
U.S. Cl. 9—347 **4 Claims**



1. A unitary seat for attaching to an inflatable toroidal inner tube float to enable a user to comfortably sit thereon and extend his legs downwardly into a body of water to manually propel the inner tube float, said tube float having a closed curve toroidal surface extending angularly about a circular central opening with a tube float having an inner diameter defining a parameter of the circular central opening and an outer diameter defining the parameter of the tube float, comprising:
a semi-rigid elongated seat member, formed of a single sheet of synthetic resin having a uniform thickness dimension, having a length dimension corresponding substantially to the outer diameter of the tube float and a width dimension less than the inner diameter of the tube float;
said seat member having a central seat section for extending across a first portion of the circular central opening while leaving a second portion of the circular central opening unrestricted to enable the user to project his legs therethrough into the body of water to manually propel the inner tube float;
said seat member having curved end sections that are formed integrally with the central seat section that extend initially outward and upward from the seat section and then outward and downward in a concave shape conforming to the curved surface of the inner tube float for extending over angularly spaced locations of the inner tube float to support the seat section on the inner tube float above water level; a curved front section that is formed integrally with the seat section and extends downward from the seat section to present a smooth curved front surface between the end sections against which the user's legs may rest;
said seat member having a curved rear section that is (1) formed initially with the seat section and extends upward and outward from the seat section conforming to the curved surface of the inner tube float, and (2) formed integrally with the end sections extending annularly about the seat section between the end section complementary with a portion of the parameter of the circular central opening for engaging the tube float between the spaced

locations to additionally support the central seat section above the water level; and

fastening means at the end sections for releasably securing the seat member to the inflatable inner tube float.

4,160,300

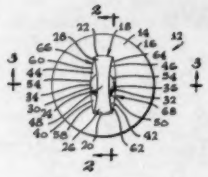
HAMMER FOR FORMING AN UNDERCUT FASTENER DRIVING SLOT

Emilio R. Marroquin, Lawndale, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sep. 15, 1977, Ser. No. 833,540

Int. Cl.[2] B23G *9/00*; B21K *1/48*

U.S. Cl. 10—7 **6 Claims**



1. A hammer for forming a fastener slot in a fastener head comprising:

(a) a primary surface,

(b) longitudinally-extending convex plateau defining a longitudinal axis having spaced-apart lines of origin generally transverse to said axis and common with said primary surface between said lines of origin to an intermediate region of maximum elevation from said primary surface,

(c) said plateau having a reduced dimension transverse to said plateau longitudinal axis at said region of maximum elevation and dimensionally flaring transversely outwardly in opposite directions to a greater transverse dimension at each of said lines of origin,

(d) spherical convexities adjacent said reduced dimension extending outwardly from said primary surface to a maximum elevation above said primary surface but less than the elevation of said plateau region of maximum elevation, said spherical convexities spaced-apart by said plateau in juxtaposition therewith,

(e) concave spherical-triangle wedges extending along and adjacent to said plateau, and extending below said primary surface from said lines of origin to said spherical convexities, said wedges coupled in pairs with the paired ones of said wedges spaced-apart by said plateau in juxtaposition therewith,

(f) adjacent ones of said paired wedges merging with a juxtaposed one of said spherical convexities therebetween at a merger line,

(g) an outer edge of each of said adjacent ones of said paired wedges extending from said merger line to an associated one of said lines of origin, said outer edges of said adjacent ones of said paired wedges and said merger line developing an ellipsoidal line of elevational demarcation between said primary surface and the said paired wedges and juxtaposed spherical convexity, and

(h) a planar and generally triangular surface on each of the opposite sides of said convex plateau at said intermediate region extending between and adjacent to said maximum elevation of said intermediate region and said associated one of said convex partial spheres, said triangular surfaces interrupting the continuity of said opposite sides.

4,160,301

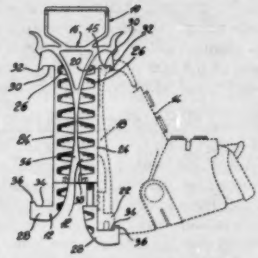
COMBINED HOLDER AND SOLE ACCESSORY

George C. Woolley, 55 Lakeshore Rd., Pointe Claire, Province of Quebec, Canada

Filed Nov. 4, 1977, Ser. No. 848,755

Int. Cl.[2] A43D *5/00*; A43B *5/00*

U.S. Cl. 12—120.5 **3 Claims**



1. A holder adapted to engage a pair of sole accessories for carrying a pair of boots, wherein the sole accessories include toe sections and convexly curved ground engaging surfaces, the holder including a handle, a stem extending from the handle, the stem including a pair of opposed curved surfaces adapted to mate with the ground engaging surfaces of a pair of opposed sole accessories, and retaining means on the holder for detachably retaining the sole accessories to the holder.

4,160,302

REFUSE COLLECTING VEHICLES

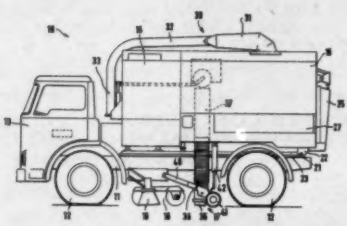
Peter B. Hirst, Billingshurst, and Anthony J. Duthie, Horsham, both of England, assignors to Johnston Brothers (Engineering) Limited, Redhill, England

Filed Nov. 17, 1977, Ser. No. 852,527

Claims priority, application United Kingdom, Nov. 18, 1976, 48226/76

Int. Cl.[2] A47L *9/00*

U.S. Cl. 15—340 **19 Claims**



1. A vacuum operated refuse collecting vehicle comprising in combination an air-tight container mounted on the chassis of the vehicle and having an outlet communicating with means for generating a vacuum within the container, brush means carried by the vehicle, a suction conduit for each side of the vehicle, each suction conduit extending at one end into the interior of the container and being provided at the other end with a nozzle which may be disposed at a short distance from the ground, and means mounted at said one end of each conduit and operable from outside the container for separately closing off said one end of each suction conduit to prevent refuse entering said one end of the conduit when it is closed, in which said one ends of said suction conduits communicate with the container in positions one on each side of a central longitudinal plane of the container and adjacent one end of the container, said outlet is positioned in the upper part of the container adjacent the other end of the container and continuously curved air-deflector means are provided above said one

end of each suction conduit, the arrangement being such that, in use, with one suction conduit open and the other closed, air entering the container through said one of the suction conduits is diverted by the respective air-deflector means up around the upper part of the container and down towards the central lower part of the container before passing out through the outlet, to prevent refuse being deposited on and around said one end of said other suction conduit.

4,160,303

MECHANICAL SWEEPERS

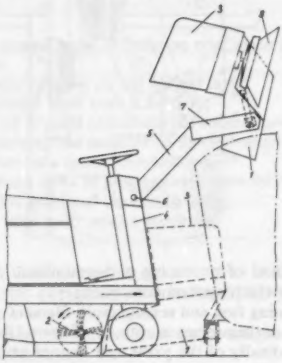
Helmut Hasenpath, Kolberg-Körlin-Str. 86, D-2060 Bad Oldesloe and Hargen Rohde, Paul V. Schoenaich-Str. 1, D 2067 Reinfeld, both of Fed. Rep. of Germany

Filed Sep. 30, 1976, Ser. No. 728,265

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1975, 2539496

Int. Cl.[2] D47L *9/10*; B60P *1/34*; E01H *1/04*

U.S. Cl. 15—349 **6 Claims**



1. In a mechanical sweeper comprising a roller brush arranged to throw rubbish forwardly of the sweeper, a hopper mounted on the sweeper to receive rubbish from the roller brush, suction means, and a filter interposed between the hopper and the suction means, the improvement comprising: a support frame mounted on the sweeper; a lifting arm pivotably mounted at one end thereof to the upper end of said support frame; a fork carried at the other end of the lifting arm, the fork pivotably mounting said hopper; arm-pivoting and hopper-tilting means mounted on the support frame, the lifting arm and the fork, for pivoting said lifting arm to thereby raise said hopper and maintain said hopper in an upright state during sweeping and lifting respectively, and for tilting the hopper from the upright state to thereby empty the hopper after the lifting arm has been raised to a predetermined pivoted position.

4,160,304

HOLD-OPEN ACCESSORY FOR A DOOR CLOSER

Gordon S. Smith, Dover, and Theodore R. Comstock, Durham, both of N.H., assignors to IMC Magnetics Corp., Westbury, N.Y.

Filed Jan. 10, 1978, Ser. No. 868,254

Int. Cl.[2] E05F *3/16*

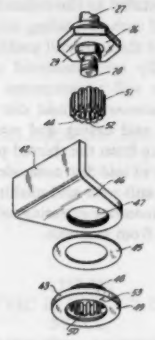
U.S. Cl. 16—49 **7 Claims**

1. A hold-open accessory for use with a door closer which applies a closing force to a door whenever it is open, the door closer having a body intended to be mounted on a hinged door or the door jamb and a shaft which rotates with respect to the body when the door is moved about its hinged axis, the accessory comprising:

a first member fixed with respect to the door closer body,

a second member fixed with respect to the door closer shaft, and

clutch means threaded into one of said members and rotatable with the other of said members in a direction in which said clutch means progressively tightens against said one member in response to opening movement of the door, to thereby progressively increase the frictional resistance to rotation between said members as the door is opened,



whereby at a predetermined open position of the door the resistance to rotation is strong enough to overcome the closing force applied to the door by the door closer and hence the door remains in the predetermined open position until manually moved toward its closed position.

4,160,305

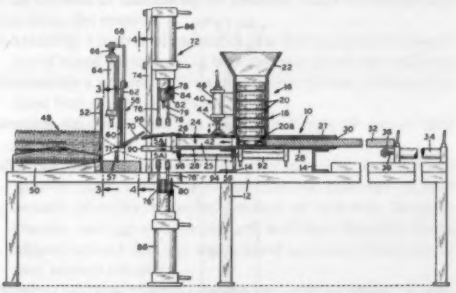
APPARATUS AND METHOD FOR INSERTING A SIZING DISC INTO A TUBULAR CASING

Oliver J. Tysver, Flossmoor, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 9, 1978, Ser. No. 884,961

Int. Cl.[2] A22C *7/00, 11/00*

U.S. Cl. 17—49 **17 Claims**



1. An apparatus suitable for inserting a sizing disc into an unshirred end of a shirred tubular casing wherein the sizing disc has a larger periphery than the unstretched inner periphery of the unshirred end of said tubular casing which comprises in combination a frame, disc storage means and disc dispensing means positioned on said frame, securing means associated with said dispensing means adapted to detachably secure an unshirred end portion of a shirred tubular casing to said dispensing means, disc advancing means communicating with said dispensing means for advancing said sizing disc disposed in planar relation to said dispensing means in a direction substantially parallel to the longitudinal axis of said dispensing means and said unshirred portion of said tubular casing and into said unshirred end of said tubular casing, and disc rotating means for rotating said disc in said unshirred portion in a direction perpendicular to the longitudinal axis of said tubular casing.

12. A method for inserting a sizing disc into an unshirred end portion of a shirred tubular casing wherein the sizing disc has a larger periphery than the unstretched inner periphery of the unshirred end of said tubular casing which comprises, unshir-

ring an open end portion of a shirred casing length, positioning at least a part of said unshirred open end portion of casing length around an exit of a sizing disc dispenser, securing said unshirred open end portion of casing length to said exit, inserting a sizing disc into said unshirred end portion such that the plane of the disc is parallel to the central longitudinal axis of said secured unshirred casing, rotating said disc through about 90° while advancing it through said unshirred casing end portion, stretching locally said unshirred casing through said simultaneous rotation and advancement of said sizing disc, continuing the advancement of said disc into said unshirred open end portion of said casing and positioning said disc a predetermined distance from the shirred portion of said casing length with the center of said disc coincident with the center of said unshirred casing and with said unshirred casing stretched about said disc, and thereafter releasing said secured portion of said unshirred casing from said exit.

4,160,306

METHOD AND AN APPARATUS FOR INDICATING LENGTH ON A ZIP FASTENER

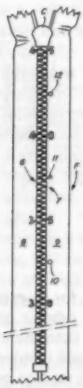
Luigi Pizzoccaro, Tirano, Italy, assignor to Interbrev S.A., Luxembourg, Luxembourg

Filed Mar. 21, 1977, Ser. No. 779,517

Claims priority, application Switzerland, Mar. 20, 1976, 3457/76

Int. Cl.[2] A44B *19/24*

U.S. Cl. 24—205 R **5 Claims**



1. A zipper fastener comprising:

a set of support strips;

a row of coupling elements molded on an edge of each support strip, said coupling elements adapted to engage the coupling elements of the other support strip;

a slider for engaging and disengaging of said rows of coupling elements; and

a plurality of molded characters extended along the length of at least one of said support strips, each of said characters constructed to indicate the length of said fastener at the approximate position of said character along said support strip, each of said characters being in contact with at least one of said coupling elements and spaced from the edge of said support strip.

4,160,307

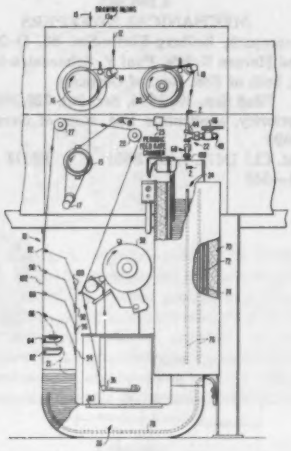
IMPROVEMENTS IN THERMOPLASTIC YARN REBOUND TEXTURIZING METHODS

David Soutar, Jr., Glen Burnie; Philip C. Feffer, Columbia, and Lloyd M. Guenther, Severna Park, all of Md., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 16, 1976, Ser. No. 742,085

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—220 **10 Claims**



1. A method of producing a thermoplastic multi-filament effect yarn, which method comprises:

(a) advancing first and second multi-filament yarns longitudinally of themselves in a stream of heated fluid advancing longitudinally of the yarns in a bounce crimper unit, the first yarn being advanced at a rate at least twice the rate of advance of the second yarn;

(b) hurling the yarns toward a foraminous surface within the bounce crimper unit by means of the stream of fluid while passing at least part of the stream of fluid through the foraminous surface;

(c) impinging the advancing yarns on the foraminous surface with sufficient force to induce a compression crimp in the filaments of at least the first yarn;

(d) instantaneously rebounding the yarn from the surface in a continuous strand-like stream into a laterally extending zone within the bounce crimper unit, the filaments of the first yarn in said zone being entangled with each other and the first yarn being entangled with the second yarn, with filaments of the first yarn protruding laterally in loop configurations of bounce crimped filament sections; and

(e) delivering the entangled rebounded yarn away from said zone and out of said unit without tensioning the yarn and while controlling the axial compression of the body of yarn exiting said zone.

4,160,308

OPTICALLY COUPLED ISOLATOR DEVICE AND METHOD OF MAKING SAME

Thomas Courtney, Redwood City, and Vijay K. Lumba, Mountain View, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 654,443, Feb. 2, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,685

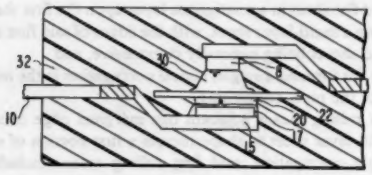
Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—588 **2 Claims**

1. A method of increasing the capability of an optically coupled isolator to withstand high voltage stresses applied thereto, the steps comprising:

forming a plurality of sets of electrically conductive leads;

attaching a semiconductor light detector to a lead in one set and a semiconductor light emitter to a lead in another set;
attaching electrically conductive wires between the detector and leads in the set in which the detector is attached;
attaching electrically conductive wires between the emitter and leads in the set in which the emitter is attached;
applying a first layer of junction coat material over the exposed portion of the detector including over locations where the wires are attached to the detector;
heating the first layer until it hardens;



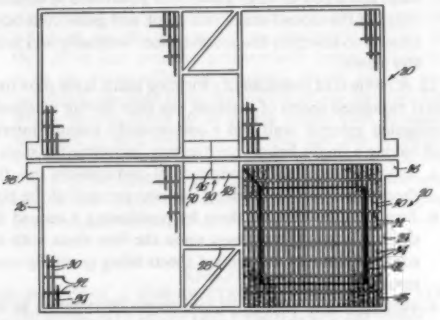
applying a second layer of junction coat material over the first layer;
placing a layer of glass on the second layer;
heating a second layer until it hardens;
placing the set of leads containing the emitter over the set of leads containing the detector so that the emitter faces the detector across a space therebetween;
applying a third layer of junction coat material in the space between the glass and the emitter; and,
heating the third layer until it hardens.

4,160,309

METHOD AND APPARATUS FOR MAKING BATTERY GRIDS

William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Division of Ser. No. 762,756, Jan. 26, 1977, Pat. No. 4,091,192. This application Jul. 21, 1977, Ser. No. 817,701
Int. Cl.[2] B29C *5/00*; B23P *13/00*
U.S. Cl. 29—2 **19 Claims**



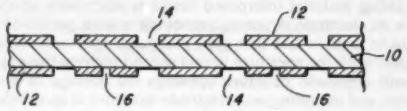
1. A method for making a paired battery grid structure, comprising molding a lead lug with integral lead conductors extending from opposite ends thereof, and molding an integral plastics member around said lead lug and said conductors, said member being formed of a pair of side-by-side rectangular frames each with a latticework of intersecting components in a center area thereof, a severable leg extending between facing sides of said frames securing said frames in said side-by-side relationship, and a pair of severable lugs each extending peripherally outward from a respective outer side of each of said frames opposite from said facing sides, said plastics molding step including molding said latticeworks to surround with said components thereof a respective one of said lead conductors, and molding facing sides of each of said frames to surround a respective opposite end of said lead lug, said severable plastics lugs being formed with sufficient rigidity to support said grid structure therebetween, whereby two separate battery grids are obtainable by severing said plastics lugs and leg from said frames, and severing said lead lug centrally thereof.

4,160,310

METAL-DIELECTRIC ELECTRON BEAM SCANNING STACK

William G. Manns, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 2, 1976, Ser. No. 746,910
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.[2] H01J *9/02*
U.S. Cl. 29—25.14 **8 Claims**



1. A method of fabricating an electron beam scanning stack comprising the steps of:
fabricating a matrix of apertures in a first and second plurality of metal plates having first and second planar surfaces;
fabricating a groove pattern in said first planar surface of at least two of said first plurality;
coating said first and said second surfaces of one of said second plurality with dielectric material;
aligning said apertures of said first plurality having said groove pattern with said apertures of said one of said second plurality to form a matrix of electron channels therein, said groove pattern of said first plurality being aligned to said first and said second surfaces of said one of said second plurality;
bonding said first plurality having said groove pattern to said one of said second plurality by means of said dielectric material;
fabricating said groove pattern into an isolation channel from said second planar surface of said first plurality, thereby fabricating a subassembly;
coating said first planar surface of at least one of said second plurality with dielectric material;
aligning said apertures of at least two of said second plurality forming a matrix of electron channels therein, at least one of said second plurality having said dielectric coating thereon;
bonding said second aligned plurality together by means of said dielectric material to form a matrix of electron channels therein;
aligning said electron channels of said subassembly with said electron channels of said bonded second plurality; and
bonding said bonded second plurality to said second planar surface of said subassembly by means of a layer of dielectric material.

4,160,311

METHOD OF MANUFACTURING A CATHODE RAY TUBE FOR DISPLAYING COLORED PICTURES

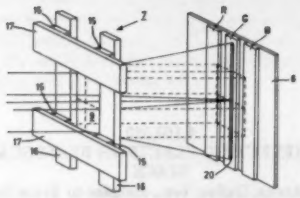
Hubertus J. Ronde, and Peter C. Van Loosdregt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 757,674, Jan. 7, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 893,065

Claims priority, application Netherlands, Jan. 16, 1976, 7600417

Int. Cl.[2] H01J 9/02

U.S. Cl. 29—25.15 18 Claims



1. In the manufacture of a color cathode ray tube having an apertured shadow mask comprising an electrode structure for producing an electron field in the mask apertures, the method comprising the steps of securing a first electrically conductive plate having a plurality of parallel ridges joined together by relatively thin strips to a second electrically conductive plate having a plurality of apertures aligned with said strips by insulating material interposed between said plates to thereby form an electrode structure, removing at least portions of said strips to form in said first plate elongated apertures which are aligned with the apertures in said second plate to thereby form in said electrode structure openings for passage of electron beams, and mounting said electrode structure in an envelope of said tube.

4,160,312

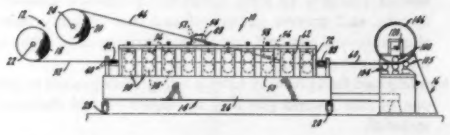
METHOD AND APPARATUS FOR MAKING MULTI-LAYER SPIRAL PIPE

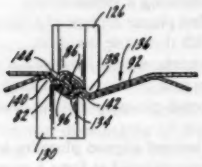
James Nyssen, 10045 Kenswood Dr., Chilliwack, British Columbia, Canada

Filed Jan. 5, 1978, Ser. No. 867,139

Int. Cl.[2] B23P 19/00, 19/04

U.S. Cl. 29—429 14 Claims





1. In an apparatus for continuously forming multi-layer pipe from plural elongated sheets of ductile material, the pipe having a corrugated exterior wall and a substantially smooth interior wall, and the apparatus having a rolling device for positioning the sheets in contiguous layers and driving the sheets, a pipe forming device for accepting the drive sheets and spiralling the layered sheets into successive, adjacent helical convolutions having a central axis formed at an oblique angle to the longitudinal axis of the layered sheets, and a seaming device to join adjacent helical convolutions, the improvement comprising:

a. first means in said rolling device for impressing continuous longitudinal corrugations in a first sheet forming the exterior wall of the pipe,

b. second means in said rolling device for positioning a second flat sheet in a contiguous layer upon the first sheet, forming a multi-layer sheet, with the edges of said first and second sheets being generally coextensive, and

c. means for forming a single, helical corrugation in the inner wall of the pipe, comprising

i. first rolling means adjacent one marginal edge of said multi-layer sheet to shape therein a first portion of said single corrugation, said first rolling means including means to form a first partial lock seam element in said one marginal edge,

ii. second rolling means adjacent the other marginal edge of said multi-layer sheet to shape therein a second portion of said single corrugation complementary to said first portion, said second rolling means including means to form a second partial lock seam element in said other marginal edge,

iii. said first and second portions being joined by said seaming device to form said single corrugation.

9. In an apparatus for continuously forming a multi-layer sheet from a plurality of elongated, continuous sheets of material, the apparatus having sources of first and second elongated sheets, a rolling device for forming longitudinal corrugations in the first sheet, and a device for guiding the second sheet into contiguous abutment with the corrugated first sheet, the improvement comprising:

the guiding device including at least one module removably mounted in said rolling device, said module comprising a framework having mounted therein a pair of elongated pinch rolls positioned on opposite sides of the second sheet and a pair of edge guide rolls positioned at opposite edges of the second sheet, said pinch and guide rolls being located to maintain the second sheet vertically and laterally stable.

12. A method of continuously forming multi-layer pipe from plural elongated sheets of material, the pipe having a helically corrugated exterior wall and a substantially smooth interior wall having a single, helical corrugation, including the steps of

a. fashioning continuous longitudinal corrugations in a first sheet positioned for forming the exterior wall of the pipe,

b. forming a multi-layer sheet by positioning a second flat sheet in a contiguous layer upon the first sheet with the edges of said first and second sheets being generally coextensive,

c. shaping a first portion of said single corrugation in one marginal edge of said multi-layer sheet and shaping a first partial lock seam element in said one marginal edge,

d. shaping a second portion of said single corrugation in the other marginal edge of said multi-layer sheet and shaping a second partial lock seam element in said other marginal edge,

e. spiralling said multi-layer sheet into successive, adjacent helical convolutions having said first and second portions abutting to form said single corrugation, and

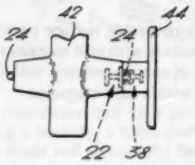
f. joining the edges of said convolutions at the juncture of said abutting first and second portions by forming said partial lock seam elements into a helical seam located in said single corrugation.

4,160,313

METHOD OF MAKING A WAX PATTERN FOR A SHELL MOULD

William H. Radford, Littleover, England, assignor to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 725,154, Sep. 21, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,561
Claims priority, application United Kingdom, Sep. 25, 1975, 39238/75
Int. Cl.[2] B23P 19/02
U.S. Cl. 29—525 7 Claims



1. A method of making a wax pattern for a shell mould including the steps of:

moulding at least one wax former with a first portion of a connector embedded in the at least one former, separately moulding a wax runner with at least one further portion of the connector embedded therein and partially projecting therefrom, said at least one further portion of the connector being complementary to and lockable in said at least first portion of the connector, removing the solidified former and runner mouldings from their moulds, then locking the former to the runner by inserting the complementary said further portion of the connector into said first portion of the connector to provide a joint at the interface between the former and the runner.

5. A method of making a wax pattern from articles comprising a former and a runner for a shell mould including the steps of:

moulding one of the articles with a socket connector therein which has a stud locked into the socket connector by an interference fit so as to pre-stress the socket wall, the socket connector being positioned in the said one moulded article so that the free end of the stud projects from that face of the one moulded article which forms the interface with the other article on assembly of the pattern, then removing the stud from the socket of the one moulded article to relieve the stress on the socket wall, moulding the other of said articles with a stud partially projecting therefrom, and then joining the one moulded article with the other moulded article by inserting the stud of the other moulded article into the socket which has room to expand in the one moulded article.

4,160,314

DEGRAINING, A THREE STEP PROCESS TO OBTAIN PROPELLANT SAMPLES FROM CASE BONDED MOTORS

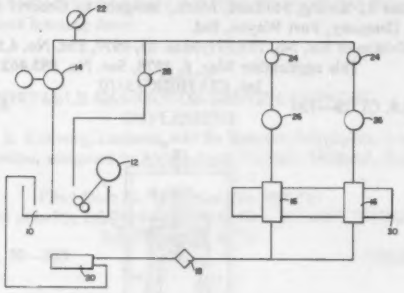
Levi G. Fridy, Hillcrest Heights, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1978, Ser. No. 901,163
Int. Cl.[2] B23P 1/00, 13/04
U.S. Cl. 29—558 3 Claims

1. A degraining process for obtaining propellant samples from metal case-bonded rocket motors, comprising the steps of:

(1) electrolytically machining two circumferential slots through the metal case to expose the propellant liner;

(2) using a piano wire cutter to cut through the two exposed strips of the propellant liner and the adjacent propellant thereby separating a metal case-bonded section from the balance of the metal case-bonded rocket motor; and



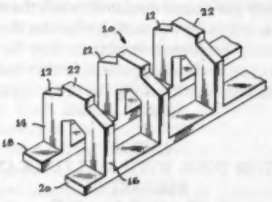
(3) using a rotational piano wire cutter to cut and separate the propellant from the metal case.

4,160,315

METHOD OF MAKING A MAGNETIC HEAD ASSEMBLY

Sirjang L. Tandon, Northridge, and John P. Moon, Thousand Oaks, both of Calif., assignors to Tandon Magnetics Corporation, Chatsworth, Calif.

Filed Apr. 17, 1978, Ser. No. 896,635
Int. Cl.[2] G11B 5/42
U.S. Cl. 29—603 19 Claims



1. The method of making a magnetic head assembly having erase heads laterally disposed relative to a read/write head in a slider member, with precise alignment and spacing of critical elements comprising the steps of:

embedding a number of erase heads at regular spacing along the side face of a slider half member, with pole pieces of said erase heads lying substantially flush with a recording plane substantially normal to the side face;

removing material from the side face of the slider half member to provide a planar side surface with a given lateral spacing between the furthest edge of the erase head and the planar side surface to define an erase track width;

indenting the side face to a selected depth at each erase head to define predetermined erase gap length;

preparing a comb-like series of read/write cores having regular spacings like those of the erase heads, the side faces of the read/write cores being planar and parallel;

bonding a pair of complementary slider half members to the read/write cores with the side faces of the slider half members being oppositely disposed and each abutting a different side planar face of the read/write cores, and with the pole pieces of the individual erase heads being adjacent the non-magnetic gaps of the different read/write cores; and

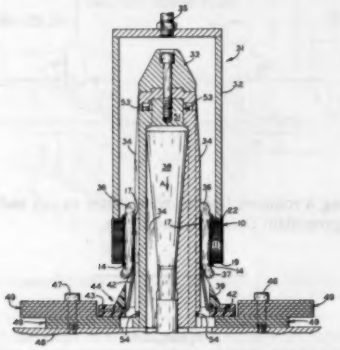
segmenting the assembled structure into individual head elements.

4,160,316

APPARATUS FOR POSITIONING INSULATING MEMBERS IN MAGNETIC CORE SLOTS

Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 779,777, Mar. 21, 1977, Pat. No. 4,104,788.
This application Mar. 6, 1978, Ser. No. 883,462
Int. Cl.[2] H02K *15/10*
U.S. Cl. 29—734 **4 Claims**



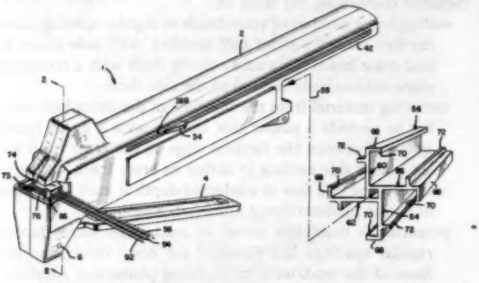
1. Apparatus for use in axially repositioning insulators that have been previously positioned in axially extending slots of a magnetic core, said apparatus including arbor means for guiding a stator assembly therealong and in a predetermined aligned relationship therewith, said apparatus further including means for contacting and arresting movement of at least some of the previously positioned insulators while the core is moved relative to such means for contacting whereby the at least some of the previously positioned insulators may be repositioned relative to the core, and said apparatus further including means for moving the core axially along the arbor means.

4,160,317

APPLICATOR TOOL WITH MULTIPLE CHAMBER MAGAZINE

Ronald G. Sergeant, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 5, 1978, Ser. No. 939,515
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—749 **5 Claims**



1. In a tool for serially feeding a plurality of connectors and connecting the same one at a time to electrical wires, the improvement comprising:

a casing;

a fixed anvil at one end of said casing;

a handle pivotally connected to said casing;

a ram slideably mounted in said casing and pivotally connected to said handle for reciprocation toward and away from said anvil;

a passageway within said casing and communicating with a work station defined between said anvil and said ram;

a thrust member slideably mounted on a first side wall of said casing for reciprocation along said passageway;

a spring for urging said thrust member along said passageway toward said work station;

a magazine slideably received in said passageway and so constructed and arranged for containing a plurality of connectors in serial arrangement;

means on said casing for positioning each connector in turn at said work station;

said magazine being aligned offset toward one side of said ram;

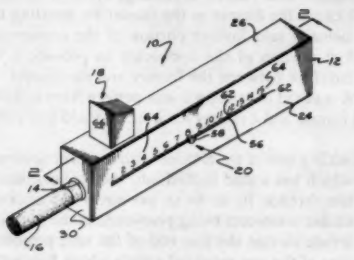
said ram having a moveable surface portion moveable into and out of alignment with said magazine for changing the size of said ram in correspondence with the size of connectors contained within said magazine.

4,160,318

APPARATUS FOR SEVERING PREDETERMINED LENGTHS FROM CIGARETTES OR CIGARS

Richard E. Morel, 295 Silver St., Greenfield, Mass. 01301

Filed Feb. 9, 1978, Ser. No. 876,533
Int. Cl.[2] A24C *5/12*
U.S. Cl. 30—113 **3 Claims**



1. A device for severing predetermined lengths from cigarettes, cigars and the like, said device comprising:

a tubular channel for receiving said cigarette or cigar, said tubular channel including a longitudinal slot therethrough along substantially the entire length thereof, and being grooved opposite said longitudinal slot,

a blade for severing the end of said cigarette or cigar disposed in said tubular channel, said blade being movable laterally through said tubular channel and biased away from the interior of said tubular channel,

stop means disposed within said tubular channel and adjustably positionable along substantially the entire length thereof whereby predetermined lengths of said cigarette or cigar may be positioned in said tubular channel for severing by said blade, said stop means comprising a plug conforming to the interior of said tubular channel, said plug including a guide extending from an edge thereof, said guide being slidably received within said groove for maintenance of the proper alignment of said plug with said tubular channel and

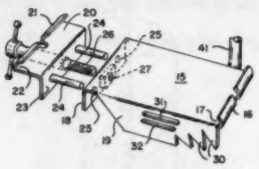
indexing means, said indexing means comprising an arm extending from said plug and received within said longitudinal slot, said plug being adjustably positionable within said tubular channel by the longitudinal movement of said arm along said slot.

4,160,319

CIRCULAR TO CHAIN SAW CONVERSION APPARATUS

Patsy Caruso, 547 S. Liberty St., Blairsville, Pa. 15717

Filed Apr. 25, 1978, Ser. No. 900,006
Int. Cl.[2] B27B 7/14
U.S. Cl. 30—122 8 Claims



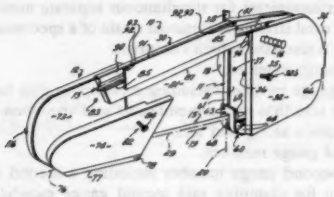
1. A chain saw conversion unit for a portable power driven circular saw having a housing, a drive shaft removably carrying a circular saw blade and a generally flat base plate on said housing comprising a main attachment plate having one end bent upwardly and back parallel to the plate forming a generally U-shaped channel adapted to receive one end of the base plate of the saw and the other end and one side bent downwardly to form a right angle flange, an L-shaped handle fixed to said main attachment plate adjacent said one end and curving upwardly and over said main attachment plate generally parallel thereto, a secondary attachment plate having one end bent upwardly and back parallel to the plate forming a second generally U-shaped channel adapted to receive the other end of the base plate of the saw and the other end of said secondary attachment plate being bent downwardly to form a right angle flange parallel to and spaced from the flange on the other end of said main attachment plate, guide means extending between said flanges to maintain them in alignment, fastener adjusting means extending between said flanges for moving said main and secondary plates together to engage the base plate of the saw within the two U-shaped channels and firmly in contact with said plates, elongate cutter guide bar means, removably and adjustably fastened to the side flange of said main attachment plate at an angle to the base plate of the saw, sprocket means removably attached to the drive shaft and an endless saw chain disposed around said sprocket and cutter guide bar means at an angle forward of the drive shaft.

4,160,320

HAND HELD BAND SAW

Mark W. Wikoff, Cincinnati, Ohio, assignor to Best & Donovan, Cincinnati, Ohio

Continuation-in-part of Ser. No. 785,037, Apr. 6, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,734
Int. Cl.[2] B27B 13/02, 13/08
U.S. Cl. 30—380 8 Claims



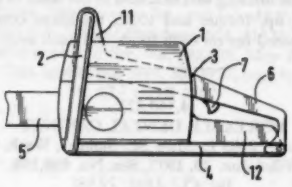
1. A hand held band saw comprising
a driven wheel housing, said driven wheel housing including a door hingedly mounted thereon,
an idler wheel housing, said idler wheel housing including a door hingedly mounted thereon, and
a crossbar section, said crossbar section rigidly connecting said driven wheel housing and said idler wheel housing, said crossbar section including a cover plate adapted to enclose the return run of an endless saw blade therethrough, said cover plate being held in assembled housing relation with said crossbar section upon closure of said idler wheel housing door and upon closure of said driven wheel housing door.

4,160,321

PORTABLE GAS-MOTOR-DRIVEN CUTTING IMPLEMENT

Tommy K. Källberg, Lindome, and Bo Rangert, Mölnlycke, both of Sweden, assignors to Aktiebolaget Partner, Molndal, Sweden

Filed Dec. 22, 1977, Ser. No. 863,320
Claims priority, application Sweden, Dec. 29, 1976, 7614660
Int. Cl.[2] B27B 17/02
U.S. Cl. 30—383 4 Claims



1. A portable gas-motor-driven cutting implement comprising
a motor unit comprising a gas-motor, a fuel tank attached to said gas-motor, and tool driving means operated by said motor,
a tool carrier and a cutting tool supported thereby, said tool carrier being attached to said motor unit and extending forwards therefrom, and said tool being arranged to be driven by said motor through said driving means,
means for carrying said motor unit, said means comprising,
a curved front handle member extending substantially transversely of the longitudinal axis of the tool carrier and at least partially surrounding the front end of the motor unit,
a handlebar member connected at its front extremity to an upper portion of said front handle member and having a handle portion located at the rear of the motor unit, and,
a brace member connecting the rear extremity of said handle portion with a lower portion of said front handle,
said front handle member, said handlebar member and said brace member being rigidly connected with each other so as to form a rigid, closed frame, and,
resilient means connecting said rigid frame with said motor unit, said resilient means comprising,
a first resilient member connecting the front end of said rigid frame to a top portion of said motor unit,
a second resilient member connecting the front end of said rigid frame to a bottom portion of said motor unit, and,
a third resilient member connecting a portion of said rigid frame located at the rear of said motor unit to a rear portion of said motor unit.

4,160,322

METHOD OF CONSTRUCTING AN ORTHODONTIC APPLIANCE

Paul D. Frazier, 6709 Old Stage Rd., Rockville, Md. 20852

Filed Dec. 29, 1976, Ser. No. 755,439
Int. Cl.[2] A61C 13/22
U.S. Cl. 32—14 C 6 Claims

1. A method for constructing an orthodontic appliance to be

placed in a patient's mouth so as to effect desired tooth repositioning, comprising the steps of:

(a) forming a model of a patient's malocclusion consisting of an impression of the patient's teeth only;

(b) separating and respositioning individual teeth with respect to the each other and the opposing arch on said model of a patient's malocclusion to form an ideal model;

(c) providing a template which conforms to the arch size and form of said ideal model, and moving said template into juxtaposition relative to said ideal model;

(d) fixing orthodontic brackets to the teeth of said ideal model to form a base means in accordance with the positional characteristics of said template while being held in an ideal position by means of said template so that each bracket is ideally positioned upon each tooth of said model; and

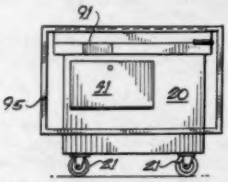
(e) transferring said brackets in conjunction with said base means and affixing said brackets to the teeth of said patient with all tip, torque and tooth thickness considerations compensated for on each tooth and each arch.

4,160,323

PORTABLE DENTAL CABINET

Ronald J. Tracy, 2603 E. Main St., Sumner, Wash. 98390

Filed Jun. 20, 1977, Ser. No. 808,198
Int. Cl.[2] A61C *19/00*
U.S. Cl. 32—22 **16 Claims**



1. A compact, lightweight, mobile dental unit, having a low center of gravity, comprising a wheeled cabinet, defining a lower compartment and a planar-top upper compartment, the cabinet compartments having a stacked height sufficient to locate the upper compartment top at a height convenient for dental operations use by either a standing or sitting dentist, the lower compartment containing a source of compressed air comprising a horizontally disposed tank of the type offered for use with self-contained underwater breathing apparatus, a vacuum chamber, and a vacuum pump connected to the vacuum chamber so as to draw gas from the vacuum chamber while permitting liquids and solids to be retained in the vacuum chamber, the upper compartment containing a storage space, a pressurizable water reservoir, and an amalgamator for preparing dental cement, the unit further comprising a first dental handpiece, a first dental handpiece pneumatic drive, first flexible pneumatic conduit means leading from the source of compressed air to the first dental handpiece pneumatic drive, first flexible water conduit means leading from the pressurizable water reservoir to the dental handpiece the unit further comprising a foldable patient support for supporting the patient in a supine position, and support frame means removably mounted on said cabinet for carrying the foldable patient support and for supporting the patient at a convenient operating elevation, and at a location spaced apart, if desired, from the cabinet, said frame means defining a recess sufficiently large to permit the frame means to be placed in a surrounding, overlying position on and around the wheeled mobile dental unit cabinet for transporting the cabinet and patient support, and to permit the frame means and patient support to be removed from contact with the wheeled cabinet for patient support use.

4,160,324

TOOL FOR LAYOUT OF BASEBALL DIAMONDS (DU-BER)

Cecil C. Dunn, 1900 W. 9th, Apt. 212, Ft. Stockton, Tex. 79735

Filed Dec. 19, 1977, Ser. No. 861,866
Int. Cl.[2] G01B *3/10*
U.S. Cl. 33—137 R **2 Claims**

1. A tool for laying out of baseball diamonds, comprising, in combination, a measuring device of elongated shape, and which is made of a flexible material, such as tape or the like, a reel to which one end of said tape is attached, so that when not in use, said tape can then be wound up around said reel, an opposite end of said tape having a master ring defining a first hole along said tape, and said tape including a plurality of other openings along said tape, at specific calibrated distances from said master ring, for defining distances of components of said baseball diamonds; said measuring device, additionally, including a whip pivotally attached to said tape, said whip comprising a second tape member, snap-fastened through one of said holes along the first said tape, said whip including a hole at one end thereof, a snap-fastener element secured at an opposite end thereof, a short length of a third tape member secured, at its one end, to an intermediate portion of said second tape member, while an opposite end of said third tape member has a mating snap-fastener element engagable with said snap-fastener element of said second tape member.

4,160,325

EXTENSOMETER

Joseph P. DeNicola, Hingham, Mass., assignor to Instron Corporation, Canton, Mass.

Filed Nov. 4, 1977, Ser. No. 848,584
Int. Cl.[2] G01B *7/16*
U.S. Cl. 33—148 D **11 Claims**

1. An extensometer for simultaneous separate measurement of each of axial strain and torsional strain of a specimen with its axis along a test axis, which comprises

a first gauge member,

said gauge member including a clamping ring for clamping said first gauge member to said specimen at a first location along said axis,

a second gauge member,

said second gauge member including a second clamping ring for clamping said second gauge member to said specimen at a second location along said axis and axially spaced therealong from said first location,

a first guide means,

a second guide means,

a first follower means, and

a second follower means,

said first follower means being guided by said first guide means,

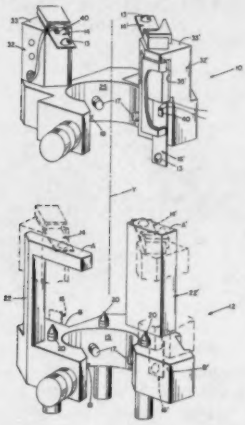
said first guide means being a planar surface parallel to said axis, and

said first guide means being fixedly carried by one of said first gauge member and said second gauge member,

said first follower means being carried by the other of said gauge members,

said first follower means carrying sensing means for sensing deflection of said first follower means by said first guide means,

said second follower means being guided by said second guide means,



said second guide means being a planar surface perpendicular to said axis and

said second guide means being fixedly carried by one of said gauge members,

said second follower means being carried by the other of said gauge members,

said second follower means carrying sensing means for sensing deflection of said second follower means by said second guide means,

whereby said first guide means and first follower means produce a pure torsional strain readout and said second guide means and said second follower means provide a pure axial strain readout.

4,160,326

THICKNESS RESPONSIVE BLANK GAUGE

Melbourne L. Griesbach, Muskegon, Mich., assignor to E.M.F., Inc., Muskegon, Mich.

Filed Dec. 30, 1977, Ser. No. 865,899

Int. Cl.[2] G01B 5/02, 5/06

U.S. Cl. 33—174 R **17 Claims**

1. A thickness responsive blank gauge for comparing the thickness and length of a flat blank to a standard blank having a predetermined length and thickness to determine if the length of the blank is equal to the standard length plus a predetermined constant times the change in thickness from the standard blank, said gauge comprising:

means for sensing the thickness of said blank; and

means operatively associated with said thickness sensing means for sensing the change in length of said blank from said standard and comparing the change in length to the sensed thickness to determine if the change in length equals the change in thickness from the standard times a predetermined constant, said means associated with said thickness sensing means comprising:

a first member engaged by said blank and shiftable laterally a distance equal to the change in length from said standard;

a second member operatively associated with said first member and shiftable a distance equal to the change in length times the reciprocal of said predetermined constant; and

output means carried by said second member for indicating when the distance of shift of said second member equals the change in thickness of said blank from said standard.

4,160,327

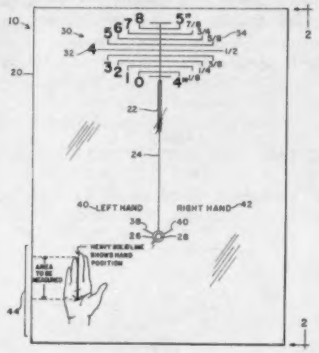
RACQUET GRIP FITTER SYSTEM

Rodger L. Martin, 340 Somerset Rd., and Donald P. Nadwodny, 350 Somerset Rd., both of Pasadena, Md. 21122

Continuation-in-part of Ser. No. 795,628, May 10, 1977, abandoned. This application Nov. 30, 1977, Ser. No. 855,942

Int. Cl.[2] G01B 5/02

U.S. Cl. 33—174 D **8 Claims**



1. A hand-measuring system for determining appropriate racquet handle circumference to fit particular human hands, comprising: means for aligning with the palm and fingers of a hand including a plate, a fixed fin as said plate at an intermediate location and projecting perpendicularly from one side thereof said fixed fin proportioned for longitudinally aligning with and extending between second and third fingers of a hand and maintaining longitudinal orientation of the plate; a fixed pointer on the plate in longitudinal alignment with said fin and proportioned for positioning by longitudinal sliding of the plate to point at the center of a palm of a hand, and fixed scale means on the plate for indicating distance along said alignment from the pointer, when the pointer is pointing at the center of a palm of a hand, to the end of the third finger of the hand.

4,160,328

SEGMENTED LONGITUDINAL MEASURING DEVICE

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,940

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727769

Int. Cl.[2] G01B 11/04

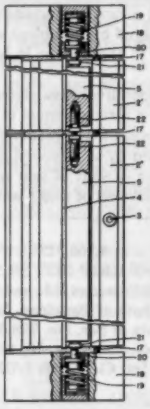
U.S. Cl. 33—125 R **11 Claims**

1. A segmented longitudinal measuring device comprising:

a plurality of housing segments arranged to form an enclosure;

a plurality of intermediate support members, with means for securing each support member to the interior of one of the housing segments in a longitudinally displaceable manner;

a plurality of measuring scale segments having thermal



expansion coefficients substantially equal to the coefficient of thermal expansion of the support members, each scale segment secured to one of the support members;

means for compressing said support members against each other end to end in an adjustable manner.

4,160,329

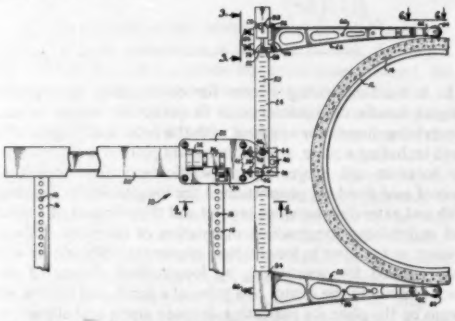
METHOD AND APPAPARATUS FOR MEASURING PIPE COATING THICKNESS

Martin R. Scrimshaw, Immingham, England, assignor to Bredero Price, B.V., Hague, Netherlands

Filed Sep. 12, 1979, Ser. No. 832,536

Int. Cl.[2] G01B *5/08, 5/10*

U.S. Cl. 33—178 D **8 Claims**



1. A device for monitoring the amount of coating material applied to the outside of a rotating cylindrical pipe which is unaffected by any whipping action of the pipe, said device comprising:

rigid support means;

elongated mounting means coupled with said support means and disposed in a generally vertical plane;

first and second sensing arms carried by said mounting means for contacting the surface of the coated pipe,

one of said arms being pivotally coupled with said mounting means at a point above the second arm, the outer end of said one arm being pivotally movable up and down in accordance with variations in the thickness of the pipe coating; and

means for pivotally coupling said mounting means with said support means, said means for pivotally coupling said mounting means with said support means being disposed between a vertical plane passing through the outer ends of said sensing arms and a vertical plane passing through the combined center of gravity of said sensing arms plus said mounting means.

4,160,330

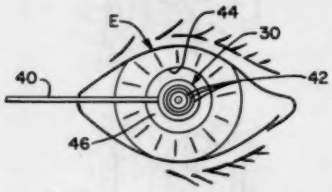
APPARATUS AND METHOD FOR MAKING OPHTHALMIC MEASUREMENTS

Bernard Grolman, Worcester, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 24, 1978, Ser. No. 881,093

Int. Cl.[2] A61B *3/10*

U.S. Cl. 33—200 **8 Claims**



1. Ophthalmic measuring apparatus attachable to a spectacles frame having a pair of lens rims and including means for supporting and adjusting an alignment reticle vertically and horizontally approximately in the plane of each of said lens rims wherein the improvement comprises, in each case of each reticle the structure of:

a circularly light diffracting disc of a diametral size less than that of the aperture of a person's pupil, said disc having circular striations for producing a perceivable bright ring pattern of light about an also perceivable bright spot target when such a target is located distantly of said disc and further when said disc is positioned before the person's pupil with fixation of the eye upon said target.

4,160,331

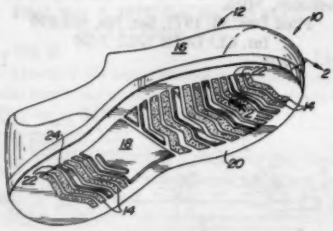
OUTER SHOE WITH GRIPPING SURFACE

Michael Bell, P.O. Box 400, Warrington, Pa. 18976

Filed Feb. 21, 1978, Ser. No. 879,163

Int. Cl.[2] A43B *23/28*

U.S. Cl. 36—59 B **10 Claims**



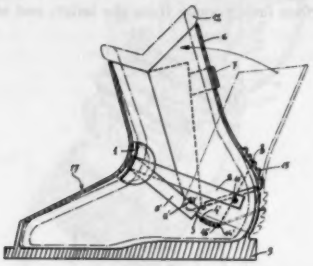
1. A shoe having a bottom surface formed from a flexible, water-proof material, said material being selected from the group consisting of natural rubber, synthetic rubber and polyvinyl chloride, said bottom surface having a plurality of discrete channels formed therein, and a gripping material in some, but not all, of said channels, said gripping material comprising an adhesive and a grit, whereby there are discrete areas of said gripping material in said bottom surface.

4,160,332

SKI BOOT

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Mar. 24, 1977, Ser. No. 781,044
Claims priority, application France, Mar. 24, 1976, 76 08543
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—119 35 Claims



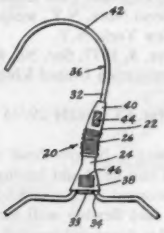
1. A ski boot comprising:
(a) a shell comprising a fixed part and a part hinged to said fixed part;
(b) means for closing said hinged part on said fixed part; and
(c) a foot-retaining system located between said shell and a skier's foot to enable the skier to immobilize his foot in the boot after placing his foot therein;
(d) said foot-retaining system being caused to bear against the foot by said hinged part when the latter is moved to be secured to said fixed part by said closing means.

4,160,333

SIGNAL TUBE

Alphonse Indelicato, 7612 Wydown Blvd., Clayton, Mo. 63105

Filed Apr. 21, 1978, Ser. No. 898,634
Int. Cl.[2] G09F *3/00*
U.S. Cl. 40—322 8 Claims



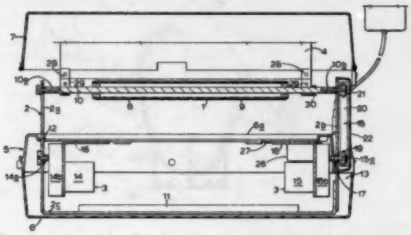
1. A signal tube for use with a hook-shaped member such as a clothing hanger having an arcuate shaped hook to suspend the hanger from a support, a body adapted to support articles of clothing therefrom, and a neck interconnecting the hook with the body; the signal tube comprising a tube means about ¾ inch or 18 mm to about 2 inches or 50.8 mm in length, having a central cavity extending the length thereof and adapted to receive and pass therethrough a hook of a hanger, said central cavity having a diameter approximately 3 times that of the neck, the tube means having a relatively stiff unbendable section and an integral continuous flexible bellows section, the latter allowing substantial bending of said tube means to facilitate the passage of said tube means over the hook as the signal tube is installed or removed from the hanger, and means to encode the tube means so that information about the hanger and its contents may be determined by observing said encoded tube means.

4,160,334

REVERSIBLE PAGE TURNER

Gordon Willis, London, England, assignor to Symot Limited, Oxon, England

Filed Nov. 9, 1977, Ser. No. 849,768
Claims priority, application United Kingdom, Nov. 9, 1976, 46653/76
Int. Cl.[2] G09F *11/00*
U.S. Cl. 40—531 17 Claims



1. A page turner comprising a support for a book, means for holding said book open, a roller having an axis of rotation, said roller mounted above said support to engage in a first extreme position a first page lying on one side of the book spline and movable to a second extreme position to engage a second page lying on the opposed side of the book spline, a mounting carrying said roller such that said axis of rotation is maintained parallel to the book spline, means independent of engagement of said roller with the pages of said book for moving said mounting with said roller in an arcuate path from one of said first and second extreme positions to the other of said first and second extreme positions, means for driving said roller in opposed senses so that in use when said roller is in said first position rotation in one sense displaces said first page under said roller and releases said first page and when said roller is in said second position rotation in the opposite sense displaces said second page under said roller and releases said second page, a flap carried on said mounting, said flap extending alongside said roller, means for moving said flap relative to said support so that in use said flap moves a released page to the opposed side of the book spline and control means for controlling said mounting moving means and said roller drive means.

4,160,335

DISPENSERS FOR THE CONTROLLED RELEASE OF PEST-CONTROLLING AGENTS AND METHODS FOR COMBATTING PESTS THEREWITH

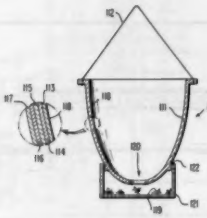
Henry Von Kohorn, Greenwich, Conn., and Agis F. Kydonieus, Kendall Park, N.J., assignors to Herculite Protective Fabrics Corporation, New York, N.Y.

Continuation of Ser. No. 535,658, Dec. 23, 1974, abandoned, which is a continuation of Ser. No. 305,032, Nov. 9, 1972, abandoned. This application Jan. 31, 1977, Ser. No. 764,312
Int. Cl.[2] A01M *1/20*
U.S. Cl. 43—131 13 Claims

1. A trap for insects comprising:
a chamber formed at least in part from a laminated dispenser material,
said chamber having at least one opening to allow outward passage of the vapors of a volatile insect attractant agent evaporating from the surface of said laminated dispenser material, and also to allow ingress of insects attracted by said volatile insect attractant agent, wherein said laminated dispenser material comprises:
at least a first solid, non-porous, polymeric wall element having at least a first outer surface exposed to the environment of said dispenser,
connector means on said trap for mounting said trap on another structure,

at least one inner layer of said laminate between said first and second wall elements comprising a layer of a solid, polymeric composition, said inner layer comprising:

at least one pest controlling agent and at least one volatile insect attractant agent, said agents being capable of migrating through said first wall element and being present in said inner layer in sufficient amount so that upon migration of at least a portion of each of said agents through said



first wall element, effective levels of said pest controlling agent and said volatile insect attractant agent are present on said first outer surface of said wall element, and

said pest controlling agent and said volatile insect attractant agent having rates of migration through said wall element so that said agents become available upon said first outer surface of said first wall element and in the surrounding environment in accordance with a desired dosage regimen for effective control of a target insect species.

4,160,336

METHOD FOR TREATING FIREANTS

Grady W. Query, 1725 Matthews Mint Hill Rd., Matthews, N.C. 28105, and O. Grady Query, 1742 Sam Rittenburg Blvd., Charleston, S.C. 29407

Filed Feb. 9, 1978, Ser. No. 876,204

Int. Cl.[2] A01M *7/00*

U.S. Cl. 43—132 A **8 Claims**

1. A method of treating fireants in ant hills comprising:

(a) combining an insecticide and a refrigerant into a mixture;

(b) injecting said mixture into said ant hills;

whereby said refrigerant immobilizes said fireants long enough for said insecticide to treat said fireants.

4,160,337

HOLLOW STRUCTURAL ELEMENT FOR ASSEMBLING A STRUCTURE

Artur Fischer, Weinhalde 34,, D-7244 Waldachtal Tumlingen, Fed. Rep. of Germany

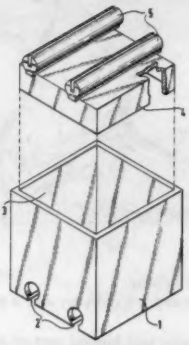
Filed Aug. 24, 1977, Ser. No. 827,310

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 7628472[U]

Int. Cl.[2] A63H *33/08*

U.S. Cl. 46—26 **7 Claims**

1. A hollow structural element for assembling a structure, comprising a hollow body part having one end face and a hollow which extends in one direction and has an open end at said one end face, said hollow body part further having another end face and being provided with at least one undercut groove in the other end face, for connecting said body part with another structural element; a separate cover which is not connected with said body part and has dimensions in two opposite directions transverse to said one direction, corresponding to those of said hollow of said body part so that said cover is connectable to said body part by being fully inserted into said hollow of said body part by movement in said one direction through said open end, said cover having a first surface facing toward said hollow of said body part and a second surface facing away from the latter; and at least one



elongated undercut projection arranged on said second surface of said cover and extending in one of said transverse directions over the entire cover member and projecting outwardly beyond a side margin of the latter so as to abut against said one end face of said body part when said cover is fully inserted in said hollow of said body part, whereby said elongated projection simultaneously can connect said cover to a further structural element and prevents said cover from excessive movement inwardly of said open end of said hollow of said body part.

4,160,338

SOUND EMITTING AND WETTING DOLL

Paul Lyons, Darenth, England; Fred Zant, Boonton, N.J., and Charles Resnick, Great Neck, N.Y., assignors to Ned Strongin Associates, Inc., New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,253

Claims priority, application United Kingdom, Dec. 29, 1976, 54203/76

Int. Cl.[2] A63H *29/16*

U.S. Cl. 46—44 **10 Claims**

1. A doll comprising a hollow head and a hollow body communicating with said head and having a flexible wall,

a body bellows mounted within said body and operatively associated with said flexible wall for compression when said flexible wall is depressed inwardly, said body bellows having an air outlet opening,

a head bellows mounted within the interior of said hollow head and having an inlet port, and outlet port, an outlet valve normally closing said outlet port, and biasing means urging said head bellows to a compressed position,

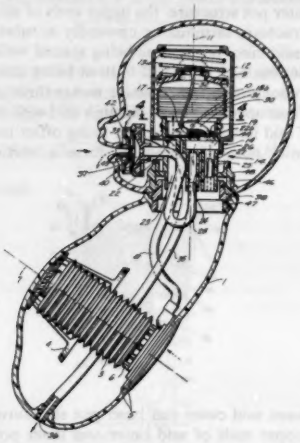
pneumatically-operated sound producing means mounted within said head and communicating with the outlet port of said head bellows through said outlet valve,

conduit means connecting the air outlet opening of said body bellows to the inlet port of said head bellows for supplying a charge of air to the interior of said head bellows with each compression of said body bellows, said head bellows being adapted to expand in successive increments from said compressed position to an expanded release position upon successive compressions of said body bellows, and

valve release means mounted within said head bellows and operatively connected to a movable portion of said head bellows and to said outlet valve for opening said outlet

valve in response to expansion of said head bellows to said release position,

whereby upon opening of said outlet valve, said biasing



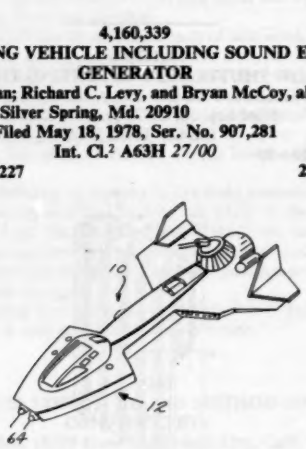
means moves said head bellows to said compressed position, causing air in said head bellows to escape through said outlet port in a sudden flow through said sound producing means.

4,160,339

TOY FLYING VEHICLE INCLUDING SOUND EFFECT GENERATOR

Scott Dankman; Richard C. Levy, and Bryan McCoy, all of 1001 Spring St., Silver Spring, Md. 20910

Filed May 18, 1978, Ser. No. 907,281
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—227 **29 Claims**



1. A toy flying craft comprising:

a body;

attitude sensing means, fixed to said body, for generating an electrical signal in accordance with the attitude of said body;

electronic means, responsive to said attitude signal for generating a multi-tone engine noise simulation signal having frequencies in accordance with said attitude; and

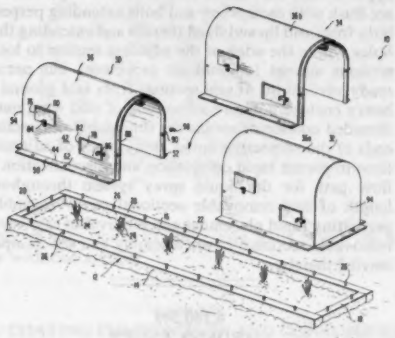
transducer means responsive to electrical input signals applied thereto for generating audio representations of said input signals, said engine noise simulation signal being applied as an electrical input signal to said transducer means.

4,160,340

PLANT PROTECTION DEVICE

Albert M. Levett, 1685 Michigan Ave., Miami Beach, Fla. 33139

Filed Nov. 17, 1977, Ser. No. 852,430
Int. Cl.[2] A01G *9/16, 9/24*
U.S. Cl. 47—27 **2 Claims**



1. Means for the protection and treatment of growing crops comprising:

a ground based heavy enclosure including side stringers and end blocks;

a series of connector elements fixedly secured at spaced intervals along the stringers and end blocks, said connector elements comprising upstanding bolts partially embedded in the stringers and end blocks;

the ground based enclosure surrounding a plurality of growing plants;

a vertically removable sectional cover assembly for said enclosure including a plurality of end-to-end joined vertically removable light weight sheet metal sections including an elongated arch form body portion; the arch form body portions having a top portion and sides with opposite lower side edges;

ventilation means for the cover assembly comprising a series of ports formed in the sides of the body portions and having doors pivotally mounted on the sides adjacent the ports;

a horizontal flange extending outwardly from each of said lower side edges;

a first end wall on the body portion of one of said sections having a bottom end edge, and a horizontal end flange projecting outwardly from said edge;

a closed end wall on another of said sections having a bottom end edge with an outwardly projecting flange;

the flanges having a plurality of holes formed therein;

the cover assembly being dimensioned to overlie the enclosure with the flanges of the side edges resting on the side stringers and the end flanges of said sections on the end blocks, with said bolts extending through the holes provided therein;

wing nuts threaded to the ends of the bolts projecting vertically from the holes within said flanges to releasably clamp said cover assembly in place for ready vertical lift removal from said ground based heavy enclosure;

a liquid spray system including an inlet hose extending through an end wall of said cover assembly and being connected to a liquid source outside the cover assembly, and an outlet spray tube extending along the top portion of the cover assembly, said spray tube comprising end-to-end joined tube sections corresponding to the cover assembly section and being fixed to the bottom of said cover assembly section at the center thereof, said outlet spray tube having orifices to form the spray at spaced intervals;

said one end wall having a port formed therein;

a bracket on said one end wall below and adjacent the port; and

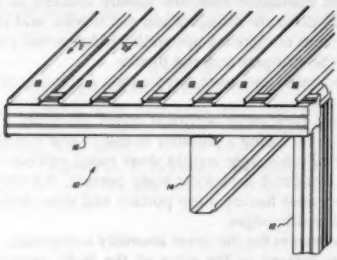
a heat transfer device removably mounted on the bracket, said heat transfer device having fan means therein to introduce heated or cold air into the cover assembly, the connecting ends between adjacent sections for one of said sections bearing a depressed lip and receiving the edge of the other adjacent section such that said edge overlies said lip; whereby, the outside surfaces of the adjacent sections are flush with each other, and bolts extending perpendicularly from said lip and fixed thereto and extending through holes within the edge of the adjacent section to lock said sections against longitudinal movement but permitting ready vertical lift of said sections from said ground based heavy enclosure upon unthreading of said wing nuts, and threaded connector means for threadably connecting the ends of the respective outlet spray tubes of adjacent sections to permit rapid completion and disconnection of the flow path for the liquid spray system throughout the length of said removable sectional cover assembly and permitting rapid placement and removal of said vertically removable sectional cover assembly and the components carried thereby.

4,160,341

GARDEN CANOPY

James A. Drake, 1132 Burgess Blvd., Dallas, Tex. 75207

Filed Jul. 26, 1977, Ser. No. 819,171
Int. Cl.[2] A01G *13/00*
U.S. Cl. 47—28 R **1 Claim**



1. A canopy for covering a garden or plant growing area, comprising:

an elevated support structure including a plurality of spaced support elements; and

a plurality of uniformly spaced-apart elongated panel members extending transverse to said support elements and being supported therefrom, said panels being in a spaced parallel arrangement, each of said panels being formed from uniform thickness material and having a uniform cross section with a flat bottom portion and inwardly curved edge sections attached from each of the longitudinal edges of the bottom portion and extending upwardly therefrom to form a trough between the edge sections and above the bottom portion of each said panel, said inwardly curved edge sections being exclusively semicircular and integrally formed with the flat bottom portion of each said panel.

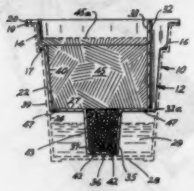
4,160,342

POTS FOR GROWING PLANTS

Grant M. Dryer, Houston, Tex., assignor to Canaird Sales Ltd., Scarborough, Canada

Filed Jul. 1, 1977, Ser. No. 812,344
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—80 **10 Claims**

1. Pot apparatus for growing plants, comprising an outer pot structure having a surrounding upstanding side wall and a horizontally disposed bottom, an inner pot structure having a surrounding upstanding side wall and a horizontally disposed bottom including a central well portion extending downwardly from its center having a surrounding side wall and a horizontally disposed bottom, said inner pot structure being removably disposed within said outer pot structure and including means around its upper end releasably sealedly engaged with said outer pot structure, the upper ends of said outer and inner pot structures terminating upwardly at substantially the same level, said inner pot bottom being spaced well above said outer pot bottom and said well bottom being closely spaced above said outer pot bottom, opening means through said inner pot bottom and opening means through said well bottom, said side wall of said inner pot structure being offset inwardly at a circumferential portion thereof to form a vertical passage



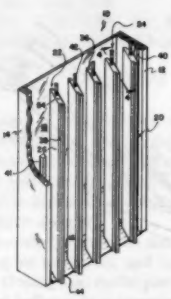
means between said outer and inner pot structures extending from said upper ends of said outer and inner pot structures downwardly to said inner pot bottom and providing an entrance for introducing water into the lower part of said outer pot structure around said well without removal of said inner pot structure, said well including means for causing water to rise upwardly through said well to wet soil placed in said inner pot structure above said well, any excess water in the soil above said bottom of said inner pot structure draining through said opening means through said inner pot bottom to be returned to said lower part of said outer pot structure around said well.

4,160,343

WINDOW SHUTTER AND MOUNTING THEREFOR

Junius P. Hubbard, P.O. Box 555, Aransas Pass, Tex. 78336

Filed Sep. 30, 1977, Ser. No. 838,217
Int. Cl.[2] E06B *7/086*
U.S. Cl. 49—90 **16 Claims**



1. A shutter arrangement for selectively obscuring and uncovering a window, comprising

a plurality of elongate slats, at least one end surface of each slat is concave toward the slat; and

means mounting the slats for movement between a first position for obscuring the window and a multiplicity of second positions transverse to the first position for at least partially uncovering the window, the mounting means comprising

means individually mounting each slat for movement about an axis extending longitudinally of the slats; and

means for individually holding each slat in any one of the

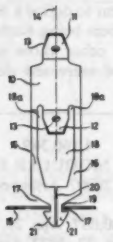
second positions including a resilient deformable member mounted in non-rotating relation to the window and of convex configuration complementary to the concave end surface of the slats, the resilient member being deformed only when the slats are in any one of the second positions.

4,160,344

SUSPENSION DEVICE FOR A SUPPORT

Johannes A. H. Brugman, Rotterdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Dec. 15, 1977, Ser. No. 860,877
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—39 **9 Claims**



1. A suspension device for a support, having an opening, in particular a support for fixing panels, said device comprising, in combination:

(a) a body portion;

(b) an upper arm of resilient material projecting laterally from a junction point on said body portion;

(c) a lower clamping arm projecting laterally from a junction point on said body portion, said upper and lower arms diverging from one another;

(d) means defining an orifice in each of said arms, said orifices being axially aligned to receive a support bar;

(e) a pair of legs which extend downwardly from said body portion and having lower free ends, the legs extending at least up to the junction point of said lower lateral arm, the legs extending past opposite sides of the lower arm;

(f) locking feet portions formed on the lower ends of said legs;

(g) means defining an opening in the body between the legs for rendering said legs flexible, the width of the opening being at least equal to the width of the lower arm;

(h) said opening having portions which extend alongside the lower clamping arm at least up to the junction point of the latter with the body; and

(i) said locking feet portions being formed to engage in said opening in said support by snap-in action.

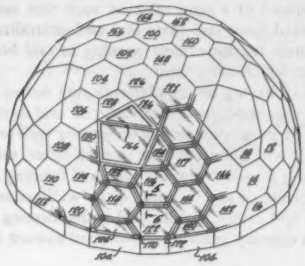
4,160,345

DOME STRUCTURE AND METHOD OF CONSTRUCTION

David L. Nalick, 10789 Freer St., Temple City, Calif. 91780

Division of Ser. No. 705,074, Jul. 14, 1976, Pat. No. 4,075,813.
This application Aug. 22, 1977, Ser. No. 826,344
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—81 **8 Claims**

1. A geodesic dome comprising a plurality of hexagonal units, each said unit comprising a plurality of elongated structural elements and continuous, bendable connector means secured to adjacent elements for joining said elements in end to end relation in a hexagonal configuration for relative angular motion with respect to one another, and means for interconnecting said hexagonal units to one another to form a dome-like structure with the elements of one unit contiguous to elements of a plurality of adjacent units throughout a major portion of the lengths of such elements, all units of a group of said units being initially formed with mutually congruent regular hexagonal shapes, at least some of the units of said group being distorted from said initial regular hexagonal shape upon



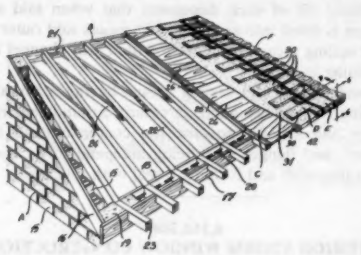
assembly of said dome to allow said units to interfit more closely with one another.

4,160,346

ROOF COATING COMPOSITION AND CONSTRUCTION

John H. Kaufmann, Somerset Parish, Bermuda, assignor to Global Coatings Limited, Hamilton, Bermuda

Filed May 11, 1977, Ser. No. 795,888
Claims priority, application United Kingdom, May 11, 1976, 19410/76
Int. Cl.[2] E04B *7/00*; E04D *11/00*
U.S. Cl. 52—96 **11 Claims**



1. A roof structure comprising, a deck covered by an insulating blanket of synthetic resin foam,

a continuous protective sheath covering the blanket and adhering tenaciously to the surface thereof and made up of a thin hard load supporting shell having high impact, flexural and tensile, and thin section strength from about 1.5 mm to about 5.0 mm thick of reinforced concrete made with hydraulic cement modified with a minor amount of a synthetic resin latex cement modifier, a fine aggregate and reinforcing material,

said shell covered by a soft weather-resistant rubbery-textured microporous membrane adhering tenaciously to its surface and having a thickness from about 0.75 mm to about 3 mm thick and laid down from a binder material of a non-plasticized latex of elastomeric type polymer filled with finely divided extender.

4,160,347

ROOF FLASHING STRUCTURE

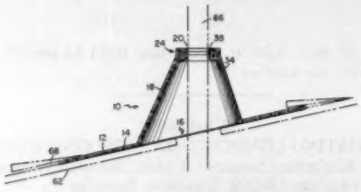
Duane D. Logsdon, Fullerton, Calif., assignor to The Logsdon Foundation, Stanton, Calif.

Filed Mar. 6, 1978, Ser. No. 883,420
Int. Cl.[2] E04B *7/00*
U.S. Cl. 52—199 **7 Claims**

1. A roof flashing structure used to form a seal between a roof and a pipe, extending through the roof, of the type

wherein a generally flat plate having a centralized opening of a larger dimension than said pipe, and an upstanding tapered housing having an internal dimension larger than said pipe are integrally formed of a rigid material such that said housing extends upward from said plate and said centralized hole in said plate forms the lowermost opening in said housing, the improvement which comprises:

said housing having an annular retaining means extending around the uppermost periphery of said housing, said retaining means consisting of an interior wall and an exterior wall which are opposite to each other, said exterior wall being formed integrally with and forming the uppermost portion of said housing, a top wall connecting said interior and exterior walls, said walls forming a circular channel opening generally downward toward said plate;



a resilient, elastomeric sealing means, said sealing means having a groove extending circularly around the upper surface of said sealing means, and said groove dividing the upper portion of said sealing means into an outer rib and an inner rib of such dimension that when said sealing means is fitted into said retaining means said outer rib of said sealing means fits closely within said channel in said retaining means;

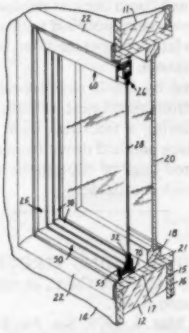
said inner rib of said sealing means having a plurality of sealing flanges extending circularly around said rib and projecting radially toward the center of said sealing means, said flanges each being independently capable of engaging with and forming a seal with said pipe.

4,160,348

INTERIOR STORM WINDOW CONSTRUCTION

Harvey A. Chapman, Richfield; John S. Fowler; John C. P. Huang, both of Roseville, all of Minn., and James B. Leslie, Wheatridge, Colo., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 16, 1977, Ser. No. 852,059
Int. Cl.[2] E06B *3/26*
U.S. Cl. 52—202 **8 Claims**



1. An interior storm window construction comprising

a pair of identical and reversible window sashes having window panes which sashes, when placed in a frame, will interlock at the adjacent edges to seal and provide a mutual support for the sashes, and

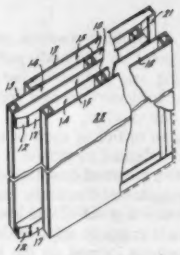
a frame structure adapted to form the frame for the window sashes, said frame comprising four frame members which are joined together at their ends and adapted to fit in a window casement and define a rectangular opening, each of said frame members being formed of a polymeric material and being formed with a pair of parallel longitudinally extending channels adapted to receive an edge of said window sashes and said channels each having means for adjusting the position of the frame member with respect to the window casement supporting the same to seal the frame members with relation to the window casement and having openings to accommodate permanent fastening members to secure said frame members to the interior of the window casement to define a rectangular opening, one of said frame members being formed with a cross-section differing from the other three said frame members to afford a channel of increased depth for forming a top frame member.

4,160,349

INSULATING MODULAR PANEL UNITS

Camiel R. DeSchutter, 20907 Ardmore Pk., St. Clair Shores, Mich. 48081

Division of Ser. No. 680,037, Apr. 26, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,209
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—481 **31 Claims**



1. An insulating barrier to cold, heat, moisture and sound comprising

a plurality of modular panel units in side by side relationship,

each said modular unit comprising at least two spaced parallel pressboard panel members each having parallel outer and inner surfaces and opposed top and bottom and opposed side edges,

reflective means on the entire outer and inner surfaces of each of said pressboard panels,

a first set of generally parallel spacer members between said panels overlying said inner reflective surfaces secured to said inner surfaces of said pressboard panels and extending between one pair of opposed edges of said pressboard panels to space them from one another,

each said spacer member of said first set comprising an enclosed tubular member spaced from and isolated from adjacent spacer members of said first set,

a second set of parallel spacer members overlying said outer reflective surfaces of each of said pressboard panels secured to said outer surfaces of each of said pressboard panels and extending between the other pair of opposed edges of each of said pressboard panels,

each said spacer members of said second set comprising an elongated member spaced from and isolated from adjacent spacer members of said second set,

and an additional panel secured to each of the second sets of spacer members, whereby when the modular units are assembled in side-by-side and top-to-bottom relation, the

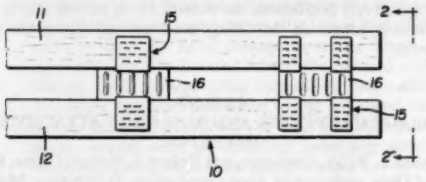
first set of spacer members are aligned and the second sets of spacer members are aligned.

4,160,350

FLOOR JOIST PLATE

Rupert G. Craib, 45654 Sherri Ct., Mt. Clements, Mich. 48044

Filed Jul. 3, 1978, Ser. No. 921,280
Int. Cl.[2] E04C *3/12*
U.S. Cl. 52—696 **5 Claims**



1. In a joist formed of a pair of horizontally arranged, vertically spaced apart, parallel wood strips, as for example wood 2×4's, and connector plates rigidly interconnecting and relatively positioning these strips, an improved connector plate comprising:

said connector plate being formed of an initially flat, thin, stiff metal sheet having a central, roughly rectangular shaped spacer web section arranged in the vertical plane between the facing edges of the wood strips;

the upper and lower portions of the sheet, i.e., the portions above and below said section, each being vertically slit to form separate upper and lower legs, each integrally joined to its respective upper and lower section edge;

at least one of the upper legs and at least one of the lower legs being bent horizontally to form a horizontal support portion, and then being bent vertically to form a vertical connector portion, with the horizontal support portion arranged to engage the facing edge of its adjacent wood strip for holding and spacing the strips, and all of the legs having connector portions overlapping the parallel vertical faces of said strips, with the connector portions of adjacent legs being alternately arranged on the opposite faces of its respective wood strip so that the wood strip is closely received in a channel-like holder formed by the adjacent legs at each of the upper and lower edges of the spacer web section;

and means formed on the leg connector portions for mechanically fastening them to the wood strips.

4,160,351

FRONT FLAP OPENER

James W. Mais, South Euclid; David L. Bianchi, Kent, and Theodore L. Barker, Hudson, all of Ohio, assignors to A-T-O Inc., Willoughby, Ohio

Filed Jan. 19, 1978, Ser. No. 870,619
Int. Cl.[2] B65B *43/39*
U.S. Cl. 53—76 **19 Claims**

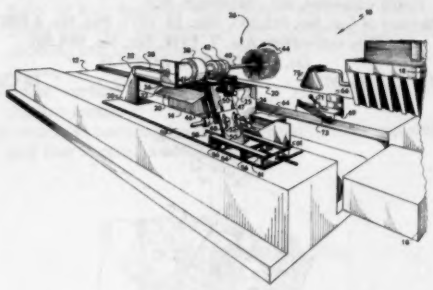
1. Apparatus for opening the front flap of a container, comprising:

first means for transporting containers in a predetermined direction, the containers having the front flap thereof folded inwardly of the container;

second means comprising a brush rotatably mounted upon a shaft and positioned above said first means for engaging the front flap of the container;

third means connected to said second means for transporting said second means in said predetermined direction; and

fourth means operatively connected to said second and third means for sensing the presence of a container beneath said



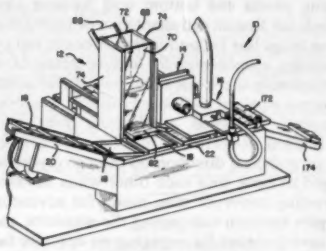
second means and thereupon actuating said second and third means.

4,160,352

PACKAGING METHOD AND APPARATUS

Elias Neff, Yellow Springs, Ohio, assignor to Antioch Bookplate Company, Yellow Springs, Ohio

Filed Nov. 17, 1977, Ser. No. 852,209
Int. Cl.[2] B65B *7/28*; B65C *1/02*
U.S. Cl. 53—137 **8 Claims**



1. Packaging apparatus comprising:

means for conveying a first box component along a first path,

means for conveying a second box component along a second path intersecting said first path,

said box components including main wall portions and side wall portions projecting from said main wall portions and one of said box components being smaller than and receivable in the other of said box components,

means for synchronizing movement of said box components along their respective paths such that said components are aligned at the intersection of their paths,

means for imposing a negative pressure above a leading edge of one of said components as it reaches the intersection of the paths of said components for raising the leading edge of said one of said components such that the adjacent side wall portions of said components are clear of each other,

said means for conveying said second box components including a pusher plate for pushing individual ones of said second box components across the path of said first box components and thereby sliding said individual ones of said second box components across individual ones of said first box components, and

means urging said individual ones of said second box components down onto said individual ones of said first box components.

4,160,353

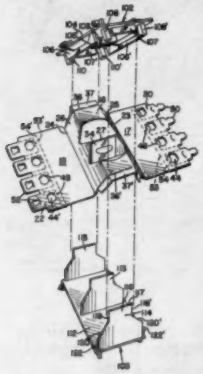
BOTTLE PACKAGING MACHINE

Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Division of Ser. No. 805,885, Jun. 13, 1977, Pat. No. 4,100,715. This application Apr. 7, 1978, Ser. No. 894,501

Int. Cl.[2] B65B *61/14, 21/24*

U.S. Cl. 53—393 10 Claims



1. In a machine for packaging an assembly of articles, which are in row arrangement, in a wrap-around type wrapper of foldable sheet material having a top wall panel, adjoining side wall forming panels and bottom wall forming panels, with certain panels cut therein and adapted to be folded inwardly on a transverse hinge line for positioning between top portions of adjacent articles, a mechanism for folding certain of said panels prior to positioning the wrapper on the articles which mechanism comprises a pair of endless traveling conveyors arranged with oppositely disposed confronting runs and having mounted thereon cooperating forming die members which extend in an outboard direction on the conveyors and which are arranged to mate with each other when advancing along said confronting conveyor runs, means for advancing successive wrappers between said mating die members, and said die members having means for engaging on opposite faces of the wrappers so as to fold certain of the panels on each said wrapper into predetermined position.

4,160,354

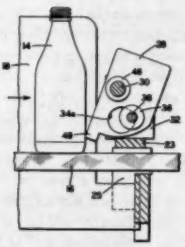
PACKING HEAD FILL SAFETY DEVICE

Wayne E. Asper, Albany, Ga., assignor to A-T-O Inc., Willoughby, Ohio

Filed May 19, 1978, Ser. No. 907,483

Int. Cl.[2] B65B *57/10*

U.S. Cl. 53—497 6 Claims



1. A safety device for a case packer filling head wherein a plurality of rows of abutted articles are fed into the filling head, an individual pivotally positioned stop member is provided for each of the rows of articles being fed to the filling head, and wherein an article moved completely into the filling head strikes a stop member to move it to an operative position but with the stop member having a normally inoperative safety position, the improvement comprising a control bar extending transversely of the filling head and extending through a non-circular aperture provided in each stop member, means urging said control bar axially, and a stop collar on the control bar for each of the stop members and sized complementary to a portion of the aperture provided in said stop member to be movable into such aperture only when the stop member is moved to an operative position at which time when all stop members are so operatively positioned, the control bar is moved axially for a control action on the filling head and articles positioned therein.

4,160,355

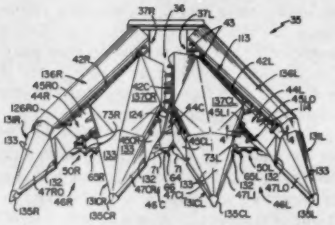
FORAGE HARVESTER AND ROW CROP ATTACHMENT THEREFOR

Nathan L. Blake, Coldwater, and Robert A. Stelzer, Celina, both of Ohio, assignors to Avco Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 599,929, Jul. 28, 1975, abandoned. This application Dec. 2, 1976, Ser. No. 746,673

Int. Cl.[2] A01D *45/02*

U.S. Cl. 56—98 3 Claims



1. A forage harvester unit adapted to move forwardly to harvest simultaneously three rows of crops spaced from one another by a distance within a range of 28 to 42 inches, comprising:

a main body having

a left hand outer divider,

a left hand inner divider,

a right hand inner divider and

a right hand outer divider,

the left hand dividers having opposed walls extending forwardly and outwardly to the left and successively defining a channel section and diverging throat and mouth sections forming a left hand crop receiving passage, the inner dividers having opposed walls extending forwardly and successively defining a channel section and diverging throat and mouth sections forming a central crop receiving passage, and the right hand dividers having opposed walls extending forwardly and outwardly to the right and successively defining a channel section and diverging throat and mouth sections forming a right hand crop receiving passage;

left hand cutter means disposed across the left hand throat,

central cutter means disposed across the central throat and

right hand cutter means disposed across the right hand throat,

the central cutter means being adapted to cut the center row of a three row group of crops, the left hand and right hand throat sections and cutter means each having a width substantially greater than the width of the central throat section and cutter means, so that the harvester requires no adjustments to harvest variously spaced groups of three rows of crops within said range;

an upper pair of gatherers individually operatively positioned along the opposed walls of the left hand passage,

a second upper pair of gatherers individually operatively positioned along the opposed walls of the right hand passage,

a lower pair of gatherers individually operatively positioned along the opposed walls of the left hand passage,

a second lower pair of gatherers individually operatively positioned along the opposed walls of the right hand passage, and

gathering means in the central passage, the lower pair of gatherers in the left hand passage sweeping across and over the left hand cutter means, the lower pair of gatherers in the right hand passage sweeping across and over the right hand cutter means; the inboard wall of the left hand passage being formed with an outboard extending shoulder proximate to the left hand cutter means and the inboard wall of the right hand passage being formed with an outboard extending shoulder proximate to the right hand cutter means.

4,160,356

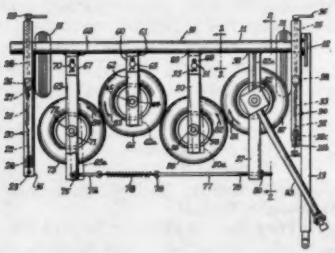
DRIVE FOR MOWER

Bernard C. Mathews, 8606 Rte. 176, Crystal Lake, Ill. 60014

Filed Feb. 6, 1978, Ser. No. 875,747

Int. Cl.[2] A01D *56/26*

U.S. Cl. 56—192 **15 Claims**



1. A drive for a mower having a wheel supported frame, a plurality of horizontally disposed cutters adapted to be rotated about their centers in a generally horizontal plane, means carrying said cutters on said frame, a plurality of horizontally disposed generally transversely positioned pneumatic tired wheels adapted to be rotated about their centers in a generally horizontal plane, means carrying said pneumatic tired wheels on said frame, means imparting rotational drive to one of said pneumatic tired wheels, means causing said pneumatic tired wheels to have frictional engagement at their adjoining surfaces, means imparting drive from said pneumatic tired wheels to said cutters, whereby said driven pneumatic tired wheel imparts drive to all of said pneumatic tired wheels and said means imparting drive from said pneumatic tired wheels to said cutters causes said cutters to be rotatably driven.

4,160,357

CATCHING SURFACE SEAL AND ROTATING TRUNK FOR A CONTINUOUS TREE CHOP HARVESTER

Donald L. Peterson, East Lansing, Mich., and Gordon E. Monroe, Warmer Robins, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 28, 1978, Ser. No. 882,003

Int. Cl.[2] A01D *46/24*

U.S. Cl. 56—329 **8 Claims**

1. An apparatus for sealing the catching surface of a continuous tree crop harvester comprising in combination:

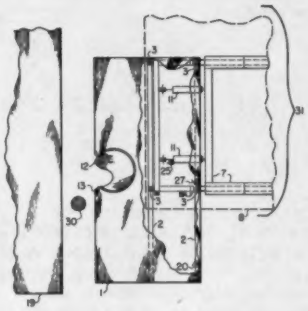
(a) a right catching surface;

(b) a track system comprising two parallel channel tracks affixed to one side of said right catching surface;

(c) a support means for said track system consisting essentially of four bearings which allow the track system to freely slide over said bearings, and said support means also allowing said track system to freely slide over said support means;

(d) four vertical columns affixed to and supporting said support means;

(e) two rigid horizontal members affixed to and supporting said four vertical columns;



(f) two support housings supporting said horizontal members but with said horizontal members capable of sliding through said housing.

(g) a main frame of one half of a continuous moving harvester rigidly fastened to said support housings;

(h) a left catching surface to be overlapped by said right catching surface;

(i) hydraulic cylinders which when energized move the right catching surface over and away from the left catching surface;

(j) a first micro-switch to activate said hydraulic cylinders.

4,160,358

FEEDING WAGONS

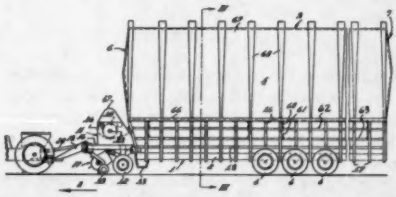
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Jul. 21, 1976, Ser. No. 707,568

Claims priority, application Netherlands, Jul. 23, 1975, 7508767; Apr. 22, 1976, 7604253

Int. Cl.[2] A01D *87/00*; **A01K** *5/00*

U.S. Cl. 56—344 **60 Claims**



1. A feeding wagon for cattle comprising a substantially horizontally disposed frame and forward and rearward ground wheels on said frame supporting said frame above the ground, a crop containing receptacle being mounted on said frame, said receptacle having a pair of side walls and a substantially flat as seen from the side floor, each wall having a plurality of beam means extending upwardly from said floor secured to a horizontal beam in their higher aspects above said floor, said beam means arranged through the length of said receptacle and defining opening means in said receptacle of a height and width whereby crop within the receptacle is accessible

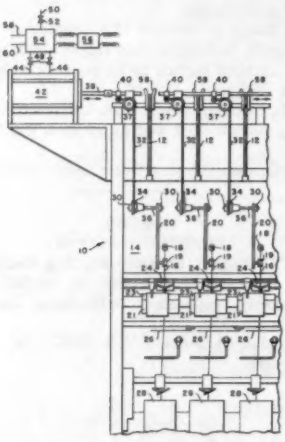
through said opening means to cattle from outside thereof beginning at the level of said floor and above, said receptacle having forward and rearward end walls for containing crop therein, said forward end wall defining an entrance substantially at the level of said floor, a crop feeding device adjacent said entrance that is adapted to move crop into said receptacle at the level of said floor for loading said wagon from the floor up, said device being coupled to the forward end of said frame by coupling means and comprising a pick-up member for picking crop up off the ground and an advancing member positioned to cooperate with said pick-up member and move crop through said entrance into the receptacle in a substantially horizontal direction.

4,160,359

RANDOM SIGNAL GENERATOR FOR THE MANUFACTURE OF SLUB OPEN END SPUN YARN

Zane Frentress, Stone Mountain, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 24, 1978, Ser. No. 899,151
Int. Cl.[2] D01H *1/12*
U.S. Cl. 57—58.89 **10 Claims**



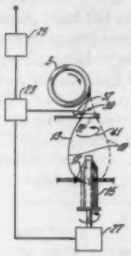
1. Apparatus to produce slub open end spun yarn comprising: a frame, a housing on said frame, means in said housing to produce open end spun yarn, a doff means in communication with said means to produce the open end spun yarn, a yarn take-up roll mounted on said frame, a pair of rolls in nip forming relationship mounted in said frame receiving open end spun yarn from said doff means and supplying said yarn to said take-up roll and means operably associated with said doff means to periodically increase the length of the yarn path between said doff means and said nip rolls and to abruptly decrease the velocity of the yarn from the doff means to substantially zero to allow a fiber build-up in said means to produce an open end spun yarn and to produce a slub in the subsequent open end yarn exiting from said doff tube, said means to periodically increase the length of the yarn path includes a random signal generator, said random signal generator includes a means to allow the number of slubs per unit time to be preselected.

4,160,360

OPTICAL STRAND SENSOR FOR DETECTING A FILAMENT BEING WOUND AND TWISTED ON A SPOOL

Robert L. Carvalho; Sheldon A. Canfield, both of Newark, and Gary Steinbaugh, St. Louisville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 27, 1978, Ser. No. 928,343
Int. Cl.[2] D01H *13/16*
U.S. Cl. 57—81 **25 Claims**



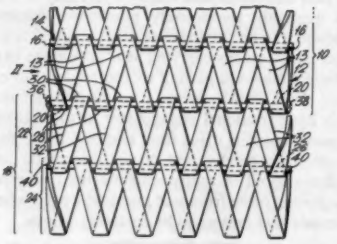
1. An apparatus for detecting a continuous filamentary material comprising a means for guiding said filamentary material placed in the path of the material, a supply for said material, a means for twisting and collecting said material as it is removed from said supply, the path of said material from said supply being substantially a free twist path to said means for collecting said material, said apparatus having a sensor mounted for detecting the presence of the material in the path defined by said supply, collecting means and said guide means.

4,160,361

JEWELRY BRACELETS

Harvey J. East, Holsworthy, England, assignor to Aurifex Limited, Holsworthy, England

Filed May 24, 1978, Ser. No. 908,955
Claims priority, application United Kingdom, Jun. 2, 1977, 23547/77
Int. Cl.[2] F16G *15/00*
U.S. Cl. 59—82 **5 Claims**



1. A detachable link assembly for a chain link bracelet comprising

a pair of oppositely handed flattened helices including convolutions having meeting ends in the form of arcs which intercalate and cooperatively form a tunnel, said helices having respective free ends;

a captive hinge pin passing through the tunnel formed by said intercalating arcs and engaged by the free ends of one of said helices, the convolutions of one of said helices including exposed end arcs defining a tunnel; and

a releasable headed pin adapted to pass through the tunnel formed by the exposed end arcs, the free ends of the helix

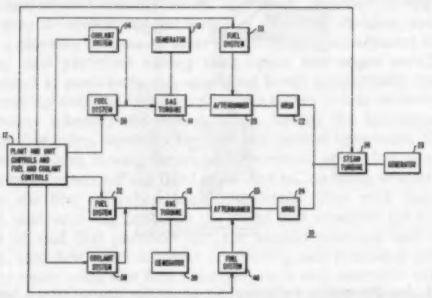
including the exposed end arcs being foreshortened so as not to obturate said tunnel.

4,160,362

GAS TURBINE AND COMBINED CYCLE POWER PLANT HAVING REDUCED EMISSION OF NITROGEN OXIDE AND IMPROVED COOLANT INJECTION FLOW CONTROL SYSTEM THEREFOR

Alan Martens, Wayne, Pa.; Thomas J. Radkevich, Wilmington, Del., and Jack R. Smith, Ross Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 31, 1977, Ser. No. 783,248
Int. Cl.[2] F02C 7/02, 9/02
U.S. Cl. 60—39.18 B **6 Claims**



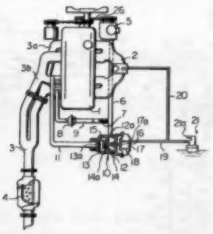
1. An electric power plant comprising a gas turbine which drives an electric generator, a system for supplying fuel to combustors included as a part of said turbine, means for controlling the fuel flow to said combustors to control the turbine speed and load, a system for injecting varying amounts of water into said combustors to control the level of NOx emission, and means for controlling said water injecting system to vary the amount of injected water and limit the NOx emissions as a function of a representation of the load and a representation of the combustor mass air flow including a representation of the position of inlet guide vanes provided for said turbine.

4,160,363

APPARATUS FOR PURIFYING EXHAUST GAS

Tatsumi Furukubo, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 28, 1977, Ser. No. 837,100
Claims priority, application Japan, Jul. 22, 1977, 52-087263
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—290 **10 Claims**



1. An apparatus for purifying exhaust gas discharged from an internal combustion engine having a plurality of cylinders, which apparatus comprises:

an exhaust pipe means provided with two entrance pipes wherein a first entrance pipe of said entrance pipes is communicated with one half of said cylinders and a second entrance pipe of said entrance pipes is communicated with the other half of said cylinders, a joint joining said entrance pipes together and an exit pipe extending from said joint;

a three way catalyzer for converting said exhaust gas disposed at a position downstream of said joint;

a secondary air means for supplying secondary air into said exhaust pipe means, said secondary air means being communicated with said first entrance pipe of said exhaust pipe means;

an air switching mea ns, the entrance of which is communicated with said secondary air means and the exit of which is communicated with said second entrance pipe, for switching secondary air from said secondary air means toward said second entrance pipe; and

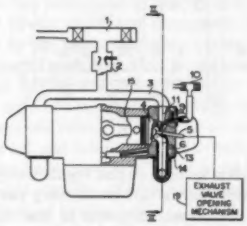
a means for detecting an operating characteristic of the engine and for actuating said air switching means so as to stop supplying said secondary air through said air switching means after detection of the fact that said engine characteristic is within a predetermined range, and to cause the alternate oscillation between different air fuel ratios in the exhaust gas passing through said three way catalyzer.

4,160,364

INTERNAL COMBUSTION GASOLINE ENGINE

Haruo Mori, Tokyo; Tadashige Ueda, and Isamu Endo, both of Musashino, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 605,145, Aug. 15, 1975, abandoned.
This application Aug. 8, 1977, Ser. No. 822,620
Claims priority, application Japan, Sep. 12, 1974, 49-105360
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—293 **4 Claims**



1. An exhaust gas purification system for internal combustion engines having at least two adjacent cylinders each defining a combustion chamber and a displacement volume thereof and each having an exhaust port communicating with the combustion chamber, respectively, comprising

an exhaust valve in the exhaust port for each of said cylinders, respectively,

a pair of the exhaust ports and a corresponding pair of said exhaust valves of the at least two adjacent cylinders, respectively, being arranged adjacent to each other,

a cylinder head having therein a branch port passage communicating with and following the exhaust port of each of a corresponding of said exhaust valves, respectively, a pair of said branch port passages being adjacent one another and communicating with said pair of the adjacent exhaust ports and with said corresponding pair of said adjacent exhaust valves of the at least two adjacent cylinders, respectively,

said cylinder head further having therein a common port passage communicatingly connected at one end thereof to both adjacent of said branch port passages of said pair of branch port passages forming therewith a siamese port passage,

a secondary air intake passage means including a check valve communicating with said branch port passage near said exhaust valve for introducing secondary air into said branch port passage through said check valve by exhaust gas pulsations,

an exhaust pipe connected to another end of said common port passage,

said exhaust pipe having a constant cross-section portion of a fixed diameter over its length, without connection to any other exhaust pipe for effective introduction of the secondary air,

heat insulation members disposed along said siamese port passage and along at least a region of said exhaust pipe, respectively, the total volume of said siamese port passage and said heat insulated region of said exhaust pipe being equal to the total displacement volume of the corresponding operatively communicating cylinders for effective oxidation of unburned exhaust gas constituents.

4,160,365

COMPRESSION IGNITION ENGINE REGULATION SYSTEM

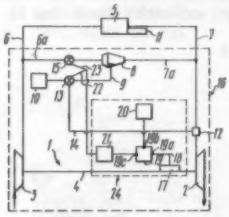
Alexandr P. Petrov; Evgeny S. Kovalevsky; Anatoly F. Kosyak, and German G. Bondarev, all of Leningrad, U.S.S.R., assignors to Tsentrainy Nauchno-Issiedovatelsky Dizeiny Institut, Leningrad, U.S.S.R.

Filed Aug. 12, 1977, Ser. No. 825,161

Claims priority, application U.S.S.R., Aug. 23, 1976, 2397628(I)

Int. Cl.² F02B *37/00*

U.S. Cl. 60—606 **2 Claims**



1. A compression ignition engine regulation system comprising: a turbocompressor; a turbine forming part of the turbocompressor; a compressor disposed in said turbocompressor and driven by said turbine; a turbocompressor shaft mounting said turbine and said compressor; a compression ignition engine with a low pressure ratio having an air inlet and exhaust outlet, and a crankshaft formed thereof; an air line in communication with said inlet of said engine and said compressor; an exhaust gas line in communication with said outlet of said engine and said turbine; a portion of a further air line connected to said air line; a portion of a further exhaust gas line connected to said exhaust gas line; a combustion chamber having inlet means connected to said portion of the air line and having outlet means connected to said portion of the exhaust gas line in parallel with said engine; a fuel line connected to said combustion chamber; an air control valve arranged to control the delivery of air into said combustion chamber and being formed in said portion of the air line between said combustion chamber; a temperature pickup disposed in said exhaust gas line at the point of entry of hot gases into said turbine; a fuel control valve arranged to control the delivery of fuel into said combustion chamber, said valve being in said fuel line and controlled by said temperature pickup; a turbocompressor speed control circuit comprising, a turbocompressor speed setting unit, a turbocompressor speed pickup, a comparison unit having a first input connected with the output of said setting unit and second input connected with the output of said speed pick-up; and an amplifying unit having an input connected to the output of said comparison unit, the output of said amplifying unit is connected with said air control valve for controlling the delivery of air into said combustion chamber and to said fuel control valve for controlling the delivery of fuel into said combustion chamber, for automatic control of the turbocompressor speed in different modes.

4,160,366

ABSORPTION REFRIGERATING APPARATUS

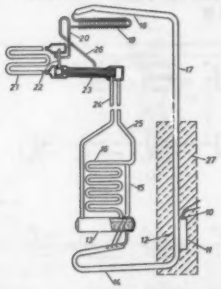
Bengt R. Reistad, Bromma, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Jun. 29, 1977, Ser. No. 811,282

Claims priority, application Sweden, Jul. 8, 1976, 7607802

Int. Cl.² F25B *15/00, 33/00*

U.S. Cl. 62—476 **7 Claims**



1. An absorption refrigerating apparatus comprising a boiler system including a pump for the liquid solution therein, a standpipe, said standpipe containing a rectifier, means for supplying heat to said boiler, a flow path provided for the liquid lifted by said pump and opening into said standpipe at a location between said rectifier and said boiler, a pump pipe located within said standpipe for the weak absorption solution supplied by said pump, and a liquid collecting conduit surrounding said pump pipe whereby a flow path is formed therein, the lower end of said conduit communicating with said standpipe, and said liquid collecting conduit being open at its upper end and extending to a plane above the upper opening of said pump pipe.

4,160,367

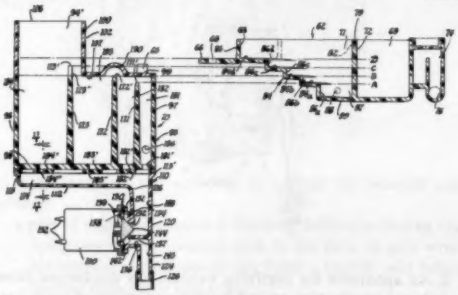
DUAL CONTAINER ADDITIVE DISPENSER FOR APPLIANCE

Nick Vona, Jr., Springboro, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 11, 1978, Ser. No. 941,274

Int. Cl.² D06F *39/02*

U.S. Cl. 68—17 R **1 Claim**



1. In combination, a washing machine comprising a cabinet having water container means, liquid additive dispenser means for said machine including a liquid receiving container and a storage container, said receiving container having a top inlet opening and an outlet formed in the bottom thereof discharging gravitationally through first conduit means into said stor-

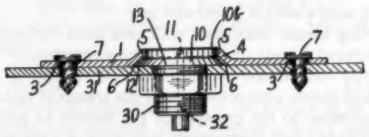
age container whereby said storage container may be supported on said cabinet at a location remote from said liquid receiving member, said receiving container having at least one sloping wall formed with a plurality of vertically spaced liquid level indicating means each defining a horizontal plane whereby each said plane is disposed at a predetermined ascending liquid storage indicia level, the lowermost indicating means disposed at a first indicia level above said receiving container outlet, said storage container having a bottom, side walls and floor means separating said container into an upper chamber and a lower chamber, said lower chamber having an outlet formed in the bottom thereof discharging into second conduit means in communication with said water container means, dispenser valve means for selectively discharging all the liquid stored in said dispenser means from said lower chamber oulet into said second conduit means, said upper chamber having a plurality of vertical spaced weir-like partitions dividing same into a plurality of separate reservoirs disposed one adjacent the other, said partitions having their upper free edges serially arranged at predetermined ascending levels substantially corresponding with the liquid level indicia means of said receiving container whereby the first partition, having the lowermost upper free edge, separates the first and second reservoirs; the second portion, having the second lowermost upper free edge, separates the second and third reservoirs and so forth; whereby upon the first reservoir being completely filled with liquid from said receiving container the liquid will overflow the free edge of said first partition into the second reservoir and so forth, said first conduit means connecting said receiving container outlet with said first reservoir, each said reservoir with the exception of said first reservoir having individual reservoir valve means each operable when open to drain its associated reservoir into said lower chamber, said first reservoir having outlet means draining same into said lower chamber, each said reservoir valve means operated to its closed position responsive to a predetermined liquid head pressure in said lower chamber established by the filling with liquid of said lower chamber and said first reservoir, whereby upon said receiving container and said upper chamber being filled with liquid to a level coincident with a preselected receiving container indicating means, the opening of said dispensing valve means results in the reservoir valve means of each reservoir having liquid therein being moved to its open position in response to the drainage of liquid from said lower chamber and said first reservoir such that the total premeasured quantity of liquid stored in said dispensing means is discharged into said water container.

4,160,368

AUTOMOBILE TRUNK LOCK GUARD

Joseph E. Solow, 54 Mitchell Ave., Plainview, N.Y. 11803

Filed Nov. 25, 1977, Ser. No. 854,795
Int. Cl.[2] E05B *63/00*
U.S. Cl. 70—417 **10 Claims**



1. An automobile trunk lock guard for securing a key-operated lock cylinder disposed within a mounting aperture formed in the exterior trunk lid surface of an automobile, comprising:

a guard plate having an aperture formed therethrough, wherein the surface of the guard plate adjacent the guard plate aperture is outwardly beveled with respect to the plate surface to form, with the trunk surface, an annular retaining groove when the guard plate is mounted to the trunk surface;

a circular insert plate having an outside edge correspondingly beveled to said outwardly beveled surface of said guard plate and adapted to be rotatably retained by the guard plate when said plate is mounted to the trunk surface; and

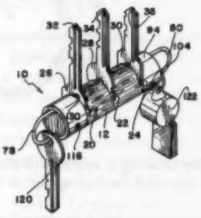
means for attaching the guard plate to the trunk surface of the automobile.

4,160,369

COMBINED KEY HOLDER AND SECURITY DEVICE

John S. Pearson, 232 S. Pinecrest, Wichita, Kans. 67218

Filed Jul. 10, 1978, Ser. No. 923,065
Int. Cl.[2] A47G *29/10*
U.S. Cl. 70—456 R **12 Claims**



1. A combined key holder and security device comprising an elongated body having transverse dimensions of a size to be readily gripped by the hand, said body having a plurality of longitudinally spaced transverse slots in one side thereof, with each of the slots having a width sufficient to accommodate reception of the head of a key therein, said slots having longitudinal spacings approximating the widths of the fingers of a body gripping hand, and means carried by the body for releasably retaining the head portion of a key in each of the slots, whereby a selected plurality of keys can be held by the body for selective individual key use while so held, and whereby the body can be gripped in the hand with the shanks of the keys extending outwardly from between the fingers of a gripping hand.

4,160,370

WATER EMULSIFIABLE LUBRICANT AND COOLANT

Kenneth J. Hacias, Sterling Heights, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Nov. 15, 1976, Ser. No. 741,901
Int. Cl.[2] C10M *1/44, 3/38, 5/24, 7/24*
U.S. Cl. 72—42 **6 Claims**

1. A lubricant and coolant composition for application as an aqueous emulsion to a metal surface prior to cold forming, consisting essentially of: about 47 parts by weight oleic acid, about 12 parts by weight of an ethanolamine, about 23 parts by weight of a heavy mineral oil, about 36 parts by weight of dialkylphenoxypoly(ethyleneoxy)ethanol, about 34 parts by weight of a sodium salt of an alkylpoly oxyethylene phosphate ester, about 98 parts by weight of a light lubricating ingredient selected from the group consisting of a light mineral oil, paraffin wax and an oxazoline wax, and about 750 parts by weight water, the emulsion having a pH ranging from about 7 to about 9.5.

4,160,371
APPARATUS FOR MAKING A SPIRAL COIL HAVING SPACED TURNS

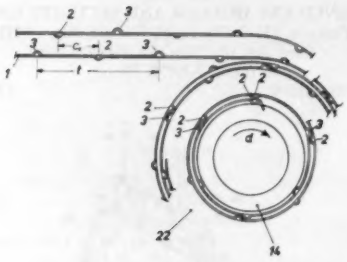
Hermann Wilkening, Dusseldorf-Kaiserwerth, and Hans-Joachim Loges, Dusseldorf, both of Fed. Rep. of Germany, assignors to Iog Industrie-Ofenbau GmbH, Dusseldorf, Fed. Rep. of Germany

Division of Ser. No. 692,430, Jun. 3, 1976, Pat. No. 4,102,170. This application Dec. 7, 1977, Ser. No. 858,203

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1975, 2524763

Int. Cl.² B21C *47/04*

U.S. Cl. 72—147 **21 Claims**



1. Apparatus for making a spiral coil comprising:
(a) a winding mandrel including drive means to rotate the mandrel,
(b) means for moving a band in uncoiled condition toward, onto and about said mandrel to form the band into a coil,
(c) means in advance of said mandrel for continuously forming a succession of regularly spaced deformations in the edges of the band, the deformations alternately protruding from opposite surfaces of the band to determine the spacing of adjacent turns of a coil formed on the mandrel, and
(d) means for progressively shifting said succession of deformations along said band for each successive turn of the coil by a predetermined dimension such that all oppositely protruding deformations in adjacent turns come into tangential interlocking engagement with each other, such predetermined dimension of shift taking into account the increase in turn length due to band thickness and coil spacing and the spacing between deformations.

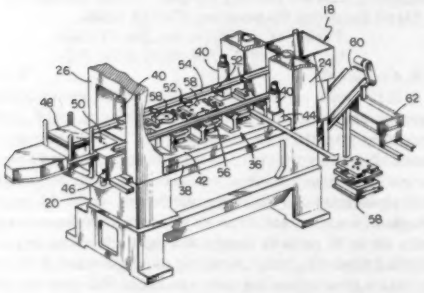
4,160,372
TRANSFER PRESS HAVING QUICK CHANGE DIE SETS

Roland J. Bergman; Richard J. Meyer, and Richard F. Fortman, all of Minster, Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Nov. 28, 1977, Ser. No. 855,313

Int. Cl.² B21J *13/02*

U.S. Cl. 72—404 **25 Claims**



1. In a transfer press having a bed, a slide, a plurality of generally linearly spaced die stations on said bed and slide the improvement comprising: said die stations including an upper and lower quick change die fixture means for supporting and accurately locating matched pairs of cooperating die parts mounted on interchangeable die plates, said fixture means including releasable clamp means for exerting clamping pressure on the die plates when activated, and when deactivated for releasing said die plates so that the upper and lower die plates can be readily removed from said respective die fixtures, and transfer means for advancing the work pieces through the transfer press successively from one said die station to the next each cycle of the transfer press.

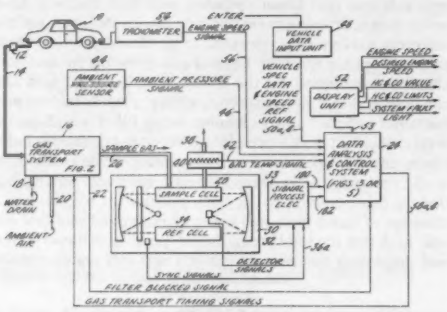
4,160,373
VEHICLE EXHAUST GAS ANALYSIS SYSTEM WITH GAS BLOCKAGE INTERLOCK

Anthony J. Fastaia, Vernon, and Thomas A. Cross, Winsted, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 718,444, Aug. 26, 1976, abandoned, which is a continuation of Ser. No. 639,670, Dec. 13, 1975, abandoned, which is a continuation of Ser. No. 534,494, Dec. 19, 1974, abandoned. This application Feb. 27, 1978, Ser. No. 881,229

Int. Cl.² G01N *21/26*

U.S. Cl. 73—23 **1 Claim**

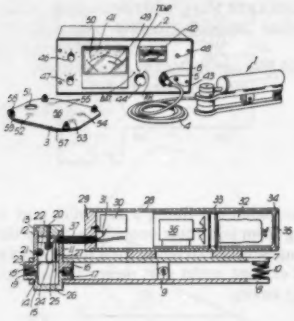


1. An engine exhaust gas analysis system for measuring the amount of a selected contaminant contained within a sample of engine exhaust gas comprising:
a gas sample cell adapted to contain a gas;
a reference cell containing a reference gas;
means including a gas transport system for filling said sample cell with a sample of exhaust gas;
sampling means associated with said cells for producing electrical signals related to the concentration of the selected contaminant within the sample of gas;
pressure means connected to said gas transport system and responsive to the pressure of gas therein to generate a blockage signal alternatively indicative of whether or not said gas pressure is in excess of a preselected pressure below which blockage of said gas transport is to be presumed; and
a data analysis and control system responsive to said sampling means and to said pressure means, for receiving said electrical signals and calculating therefrom the concentration of the selected gas contaminant and providing an output signals indicative thereof, only in concurrence with said blockage signal indicating the pressure in said gas transport system being in excess of said preselected magnitude.

4,160,374
APPARATUS FOR MEASURING THE DIFFUSIVE RESISTANCE OF PLANT STOMATA

Terence J. Crump, and Janet M. Crump, both of Carlone House, Church Rd., Ramsden Bellhouse, Billericay, Essex CM11 1RR, England

Filed Apr. 24, 1978, Ser. No. 899,600
Int. Cl.[2] G01N *33/00*
U.S. Cl. 73—76 7 Claims



1. Apparatus for measuring the diffusive resistance of plant stomata, comprising:

a cup;

means for sealingly clamping said cup to a plant leaf being tested to define an enclosed air volume in said cup adjacent the surface of the leaf; of humidity sensor in said cup for providing a signal indicative of the humidity of the air in said cup;

a counter;

control means for receiving the output signal from said humidity sensor and operative to start said counter at a lower set humidity value and to stop said counter at an upper set humidity value, thereby to time the rise in humidity between said lower and upper humidity values in a measurement cycle; and drying means for drying the air within said cup down to a value below said lower set humidity value after each measurement cycle;

in which apparatus the improvement comprises said control means being adjustable to vary at least one of said lower and upper set humidity values and to vary the difference between said lower and upper set humidity values.

4,160,375
INDICATOR COMPOSITIONS

Philip I. Brittain, Bray, and Michael R. J. Lyons, Iver, both of England, assignors to Brent Chemicals International Limited, Iver, England

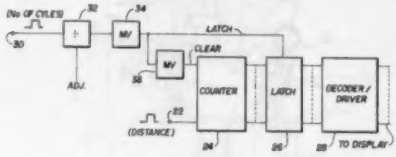
Filed Mar. 13, 1978, Ser. No. 886,325
Claims priority, application United Kingdom, Mar. 17, 1977, 11285/77
Int. Cl.[2] C09K *11/06*; G01N *19/08, 21/16*
U.S. Cl. 73—104 12 Claims

1. A method of detecting flaws in the surface of an object which comprises applying to the surface a water washable, wash resistant biodegradable dye penetrant composition comprising one or more dyes and at least 70% by weight of a primary alcohol ethoxylate component, the said component consisting essentially only of one or more compounds of formula $RO(CH_2CH_2O)_mH$ wherein R is the hydrocarbon residue of a substantially straight chain saturated aliphatic alcohol of 8 to 18 carbon atoms and m is 2 to 4 and wherein at least 50% of the composition is provided by introducing into the composition one or more compounds of said formula, the introduced compounds together having a value of m of 2.5 to 3.5 and R in each compound contains 9 to 13 carbon atoms, washing the surface and thereby gelling the composition in the flaws, and observing the gelled composition.

4,160,376
METHOD AND DEVICE FOR ESTIMATING FUEL CONSUMPTION

William N. Borkan, 3031 Prairie Ave., Miami Beach, Fla. 33140

Filed Jun. 3, 1977, Ser. No. 803,101
Int. Cl.[2] G01F *9/00*
U.S. Cl. 73—113 16 Claims



1. In a fuel consumption estimating and indicating device including means for generating a first signal representing distance traversed by a vehicle, means for generating a second signal representing fuel consumed, and means responsive to said first and second signal for generating a third signal representing distance traversed per volume of fuel, the improvement being said second signal means which comprises:

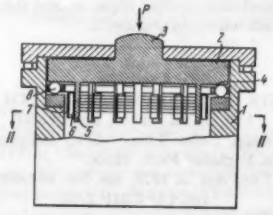
means for sensing the number of cycles of operation of the cylinders of the vehicle's engine; and

means for modifying said sensed number by a constant representing an estimate of fuel delivered to a cylinder to generate said second signal.

4,160,377
LOAD CELL

Vasily I. Pechuk; Vladimir M. Pompeev, and Nikolai B. Karikh, all of Kiev, U.S.S.R., assignors to Kievsky Institut Avtomatiki Imeni XXV Siezda KPSS, Kiev, U.S.S.R.

Filed Apr. 18, 1977, Ser. No. 788,458
Int. Cl.[2] G01L *1/22*
U.S. Cl. 73—141 A 9 Claims



1. A load cell comprising:

a housing having internal projections;

a resilient element accommodated within said housing having a lug on one side thereof to take up the load and a back side spaced from said projections in opposition thereto, a group of spaced props on said back side of said resilient element arranged along concentric circles;

a plurality of balls interposed between said projections and said back side, whereby rolling contact is established therebetween; and,

a resistance strain gauge drawn between said props and extending substantially radially of said circles.

4,160,378

TIRE TESTING MACHINE

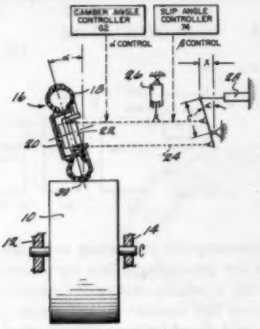
Günther Himmler, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann G.m.b.H. & Co., KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,187

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726927

Int. Cl.[2] G01L *15/16*; G01M *17/02*

U.S. Cl. 73—146 9 Claims



1. A method for the determination of characteristic values for tires and rims forming wheels and the attitude of the endurance limit of said tires and rims comprising the steps of:

rolling said wheel about its axis on a cylindrical drum at a predetermined contact pressure between said wheel and said drum and at camber angle α and a slip angle β so as to generate forces at the contact area between said wheel and said drum said forces having lateral and vertical force components R and S and so as to generate a redress couple MR;

measuring, with a torque indicator, rotational forces about said axis resulting from said rolling step;

releasing said forces applied to said wheel according to a preset test program;

transforming said measured forces into a set of forces at the contact area of said wheel with said cylinder, said transforming step taking into consideration the mutual influence of forces depending on at least one of the slip angle β, and the camber angle, α, of said wheel; and

readjusting all of said forces by altering at least one of said slip angle, β, said camber angle, α, and the contact pressure of said wheel on said drum.

4,160,379

COMPOSITE FLUID FLOWMETER WITH SLOTTED ARCUATE AXIAL EXHAUST

Dwight A. Knupp, Union Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 3, 1978, Ser. No. 892,458

Int. Cl.[2] G01F *1/06*

U.S. Cl. 73—229 9 Claims

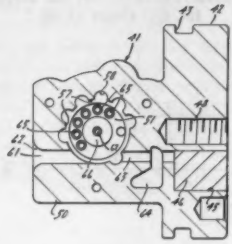
1. A composite tangential exhaust and axial exhaust fluid flowmeter comprising

elongated housing means of substantially rectangular cross-section and having a substantially cylindrical cavity therein,

fluid inlet port means and fluit outlet port means communicating with and extending generally longitudinally of said housing means and tangentially of said cavity,

axial exhaust fluid outlet port means including a generally arcuate shaped, elongated slotted opening formed in said housing means and communicating with said inlet port means to exhaust fluid axially transversely of said cavity in parallel with said tangentially extending fluid outlet port means, said slotted opening displaced radially from the center of the cavity and located in a region past the tangential outlet port means in the direction of rotation of the fluid around the cavity, and

rotor means contained in and journaled for rotation on the geometrical central axis of said cavity and rotatable by all



of the fluid admitted through said inlet port means and exhausting from said rotor containing cavity through any of said tangentially extending fluid outlet port means and said axial exhaust outlet port means formed in said rotor containing cavity.

4,160,380

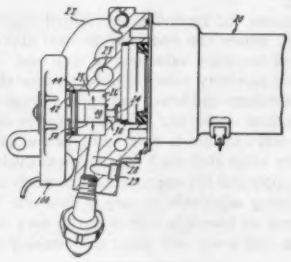
PUMP ENCLOSED FLUID FLOWMETER

Carroll J. Dunne, Jr., Toledo, Ohio, and Ian J. C. Scott, Madison Heights, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 3, 1978, Ser. No. 892,459

Int. Cl.[2] G01F *1/06*, *15/18*

U.S. Cl. 73—229 10 Claims



1. In combination with a fluid metering pump having a pump housing and a cover for said housing having a cylindrical outlet chamber therein, said cylindrical chamber open at one end thereof and having a passage in its other end communicating with the high pressure side of said pump through said pump cover;

a fluid flowmeter bodily received within the open end of said cylindrical outlet chamber in said cover and including

a cylindrical header portion, a reduced body portion of integral formation with and stemming from said header portion and having a fluid chamber therein, a rotor element journaled for rotation in said body portion, and electrical sensor means contained in said body portion for sensing rotation of said rotor element in said fluid chamber,

said body portion having fluid inlet port means and seating against the said other end of said cylindrical outlet chamber with the fluid inlet port means in the body portion in direct registration and open communication with said communicating passage in said pump cover to receive all of the fluid discharged from said pump directly into said fluid chamber in said body portion of said flowmeter, and fluid outlet port means in said reduced body portion to

exhaust fluid from said fluid chamber externally of said body portion and into said cylindrical outlet chamber in said pump cover, said header portion readily attachable to and removable from said cover without disassembly of said flowmeter and pump cover, and sealing means between said header portion and said pump cover to seal the open end of said chamber in said pump

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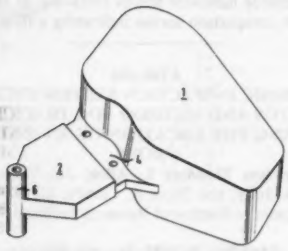
4,160,381

FLOATS AND METHOD FOR MAKING SAME

Anthony D. Jackman, Woking, England, assignor to Bettix Limited, Surrey, England

Filed Nov. 7, 1977, Ser. No. 849,421
Int. Cl.[2] G01F *23/06*
U.S. Cl. 73—322.5 **6 Claims**



1. A float for the control of liquid level, comprising one or more blow moulded float bodies, each with an integral compression moulded tag, and an injection moulded mounting or bridge having a structure and an integral interconnection to one or more tags characterized by its having been moulded directly and integrally during its formation in the injection mold to the said one or more tags and shaped to support the float in a carburettor or other reservoir.

3. A method of making a float for the control of a liquid level comprising the steps of:

blow moulding a float body in the shape of the float including compression moulding an integral tag extending outwardly from the body of the float;

attaching the moulded float body to an injection moulding machine with the tag located within the injection mould cavity, and

injecting material into the injection mould to form a mounting or bridge directly, integrally secured to the tag and shaped to support the float in a carburettor or other reservoir.

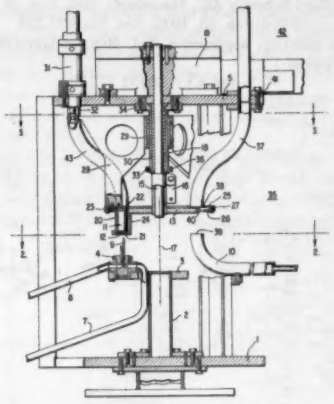
4,160,382

SAMPLE TAKING DEVICE FOR TOXIC AND/OR RADIOACTIVE SUBSTANCES

Lorenz Finsterwalder; Horst Zeh, both of Karlsruhe, and Ulrich Schaarschmidt, Stutensee, all of Fed. Rep. of Germany, assignors to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH, Eggenstein-Leopoldshafen, Fed. Rep. of Germany

Filed Sep. 16, 1977, Ser. No. 834,253
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—422 R **8 Claims**

1. In apparatus for taking samples of toxic and/or radioactive substances by introducing such substances into sample vessels, which apparatus includes a holder for holding such a vessel, at least one needle head filling system composed of upwardly pointing hollow needles for introducing a sample of one such substance into such vessel at a filling position, and inlet and outlet conduits for conveying vessels to or from the holder at a transfer position, the improvement wherein: said holder comprises a turntable having a sleeve for accommodating such sample vessel, said turntable being mounted to undergo rotary movement to convey a sample vessel in said sleeve between the filling and transfer positions, and an assembly of a cover and a disc between which said turntable is disposed and presenting a circular space for guiding said sleeve over said filling system, and said apparatus comprises a stand



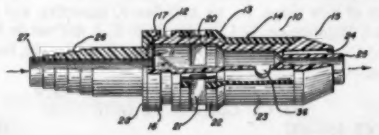
supporting said filling system below said holder, and a lifting device connected for imparting a translational movement to said holder to bring a vessel in said holder into operative association with said filling system, which translational movement is independent of the rotary movement of said turntable.

4,160,383

UNITARY SAMPLE-VENT-VALVE ASSEMBLY

Richard A. Rauschenberger, Brookfield, Wis., assignor to Will Ross Inc., Milwaukee, Wis.

Filed Dec. 27, 1977, Ser. No. 864,580
Int. Cl.[2] G01N *1/20*; A61F *5/44*
U.S. Cl. 73—422 R **5 Claims**



1. A unitary sample-vent-valve assembly comprising:

a tubing connector having a first end and a second end, said first end being adapted for attachment to accessory patient tubing and said second end terminating in a first flange having first and second concentric ribs on the face thereof, said second rib being of greater diameter than said first rib;

a tubular body having a second flange at one end thereof joined to said tubing connector and adapted to engage a fluid line at the other end thereof, said second flange having a circular recess on its face to cooperatively engage said second rib and align said tubular body with said tubing connector, said tubular body defining at least one first opening through its sidewall and a second opening through its sidewall;

valve means retained between said first and second flanges, said first rib forming a seat for said valve means;

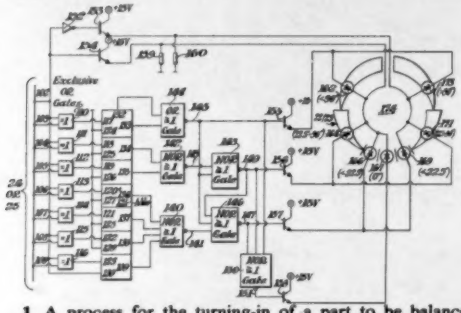
vent means formed of a semi-permeable material layer overlying said first opening, and

sampling means formed of a resealable, pierceable material overlying said second opening.

4,160,384
PROCESS FOR THE TURNING-IN OF A PART TO BE BALANCED AFFECTED BY IMBALANCE

Volker Guyot, Buettelborn; Otfrid Maus, Darmstadt, and Martin Müller, Bickenbach, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed Feb. 13, 1978, Ser. No. 877,231
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724624
Int. Cl.[2] G01M *1/22*
U.S. Cl. 73—462 7 Claims

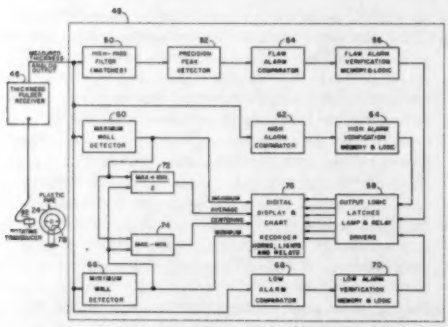


1. A process for the turning-in of a part to be balanced affected by imbalance, particularly a motor vehicle wheel, in a balancing machine having a shaft, storing angular information, having light signals relating to the balancing position, which is adjusted into a balancing position by a comparison of the particular angular positions of the shaft with the stored angular information and light signals relating to the balancing position as an indication for the resulting adjustment, comprising the steps of illuminating the light signals to indicate the direction to turn the part toward the balancing position from a momentary out-of-balance position, and illuminating in sequence several light signals signifying progressively shorter intervals as the balancing position is approached whereby the balancing position may be gradually approached without overshooting.

4,160,385
PIPE QUALITY MONITORING MECHANISM

Roy J. Gromlich, Wrightstown, N.J.; Kilian H. Brech, deceased, late of New Hope, Pa. by Avis Brech, executrix, and John D. Cist, Wilmington, Del., assignors to E. I. duPont de Nemours and Co., Wilmington, Del. and Sonic Instruments, Inc., Trenton, N.J.

Filed Jun. 30, 1977, Ser. No. 811,975
Int. Cl.[2] G01N *29/04;* G01B *17/02*
U.S. Cl. 73—622 21 Claims



8. A system for inspecting tubular material in which the tubular material passes through an inspection apparatus including a chamber supplied with liquid to fill the path between the tubular material and ultrasonic transducer means providing means to transmit ultrasonic pulses inwardly to the tubular material and receive pulses reflected at least from the outer and inner wall surfaces of said tubular material and means to provide relative rotation of the ultrasonic transducer means around the tubular material as said tubular material passes generally axially through said chamber, comprising:

a pulse generating source for the ultrasonic transducer means to provide pulses at a rate sufficiently frequent to permit examination of the entire tubular material;

a pulse receiving and interpreting means for generating a signal representative of rate-of-change of wall thickness of the tubular material at successive measurement intervals around the tube;

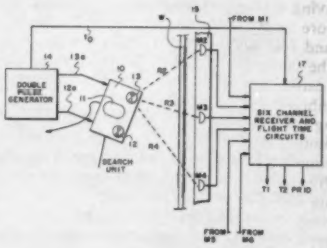
comparison means for comparing the dimensional wall thickness rate-of-change signals with at least one predetermined rate-of-change tolerance limit to identify flaws; and

out-of-tolerance indicator means receiving an output signal from the comparison means indicating a flaw.

4,160,386
ULTRASONIC INSPECTION SYSTEM INCLUDING APPARATUS AND METHOD FOR TRACKING AND RECORDING THE LOCATION OF AN INSPECTION PROBE

Jerry L. Jackson; Theodore L. Allen, Jr.; Wayne T. Flach; William D. Jolly, and Steve A. Cerwin, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Jun. 9, 1977, Ser. No. 804,931
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—625 41 Claims



1. In an ultrasonic inspection system for randomly inspecting along the surface of an object, said system including an inspection probe having at least one ultrasonic transducer, means for periodically pulsing the transducer to cause it to emit ultrasonic waves, and ultrasonic signal receiving and processing means including means for receiving echo signals from said object being inspected and for acting on the received echo signals to provide useful information concerning the condition of said object in the area being inspected, the improvement comprising, apparatus for providing tracking information relating to the location of the inspection probe at different and random locations on said object, and with respect to a fixed reference on said object, said apparatus comprising at least one source of radiant energy located at a known distance from one of said transducer or fixed reference, to provide a plurality of airborne sound tracking signals during the inspection operation; at least two signal receiving devices located at a known distance from one of said fixed reference or said at least one ultrasonic transducer, and located with respect to each other so that the distance from the source of radiant energy to each of said receiving devices can be detected and utilized to determine the location of said source of radiant energy with respect to the receiving devices; and means connected to receive the output signals from said receiving devices for responding to tracking signals received to detect the flight time of the airborne sound signals from said radiant energy source to each of

the receiving devices and provide output signals indicative of the distances detected and also indicative of the orientation of the ultrasonic transducer with respect to the object being inspected.

4,160,387

METHOD AND APPARATUS FOR DETECTING INTERNAL CAVITIES IN CASTING BARS

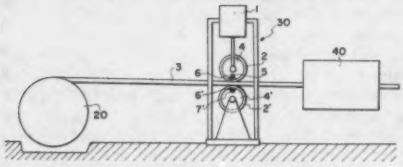
Susumu Ihara; Hiroyuki Yoshimoto; Katsumi Mizuuchi, all of Osaka; Hideo Nishiumi, and Takanobu Suzuki, both of Kawasaki, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 27, 1977, Ser. No. 864,910

Claims priority, application Japan, Dec. 28, 1976, 51-159718; Nov. 16, 1977, 52-138210

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—639 **4 Claims**



1. A method of detecting the internal cavities in a continuous casting bar, comprising:

holding between first and second rollers with a predetermined holding pressure, two opposite surfaces of a casting bar delivered from a continuous casting machine, each said roller having a hollow portion;

transmitting through said casting bar, through a crown-shaped outer wall of said first roller in contact with said casting bar, an ultrasonic wave having a predetermined frequency generated by an ultrasonic wave device for transmission disposed within the hollow portion in said first roller; and

detecting, by means of an ultrasonic wave device for reception disposed within the hollow portion of said second roller, the amount of said ultrasonic wave which is transmitted through said casting bar and through a planar surface of the outer wall of said second roller in contact with said casting bar.

4,160,388

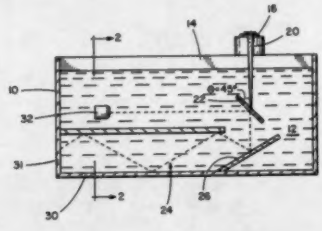
POWER MEASURING APPARATUS FOR ULTRASONIC TRANSDUCERS

Victor Carriere, London, Canada, assignor to Bach-Simpson Limited, London, Canada

Filed Jun. 19, 1978, Ser. No. 916,474

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—646 **10 Claims**



1. Apparatus for measuring the power output of a transducer comprising:

(a) a taut-band meter movement positionable as a function of applied electric current,

(b) an arm connected to said meter movement for displacement therewith,

(c) a target vane suspended from said arm, the energy to be measured being directed at said vane from said transducer,

(d) means for applying current to said meter movement to position said arm at a null point or position,

(e) means for altering the current applied to said meter movement, responsive to the force produced by said energy impinging on said target vane, to maintain said vane at the null point,

(f) means for determining the magnitude of the current required to maintain the target vane at said null point before and during operation of said transducer, the change in current being a measure of transducer power.

4,160,389

CENTRIFUGAL CLUTCH AND DRIVE MECHANISM FOR REMOTE CONTROL APPARATUS

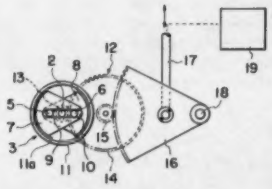
Takashi Kubono, Omiya, Japan, assignor to Toyo Kogyo Company Limited, Hiroshima and Tanaka Instrument Company Limited, Yono, both of, Japan

Filed Jan. 11, 1977, Ser. No. 758,367

Claims priority, application Japan, Jan. 13, 1976, 51-1789[U]

Int. Cl.[2] F16H *21/40*; F16D *43/18*

U.S. Cl. 74—89.18 **8 Claims**



1. An apparatus for driving a remote controlled mechanism, comprising;

(a) an electric motor having a rotatable drive shaft,

(b) centrifugal clutch means comprising a plurality of weight members, a weight mounting means secured to said drive shaft for rotation therewith and including means loosely mounting and confining said weight members such that they are freely movable in a radial direction but are constrained to rotate with said weight mounting means, and a cylindrical member freely rotatably mounted to said drive shaft and including an inner wall surrounding said weight members, whereby the latter are moved radially outwardly by centrifugal force when said motor is energized, and frictionally engage and drive said cylindrical member,

(c) a pinion gear secured to said cylindrical member,

(d) reduction gear means engaging said pinion gear,

(e) a pivotally mounted sector gear engaging said reduction gear means and adapted to swing over a predetermined angular range in response to the rotation of said reduction gear means, and

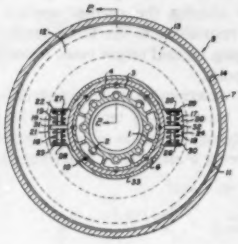
(f) an actuating member connected to said sector gear and adapted to move in a substantially linear manner for operating said remote controlled mechanism in response to the energization of said motor.

4,160,390

TUNED TORSIONAL VIBRATION DAMPER

Theodore W. Spaetgens, 6963 Fremlin Ave., Vancouver, B.C., Canada V6P 3W3

Filed Jun. 16, 1977, Ser. No. 807,279
Int. Cl.[2] F16F *15/00*
U.S. Cl. 74—574 3 Claims



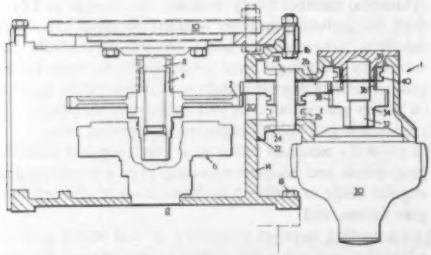
1. A tuned viscous torsional vibration damper comprising:
a central hub for connecting the damper to a rotatable shaft;
a hollow cylindrical housing with a circular inner wall surrounding the hub, a circular outer wall, and disc-shaped side walls;
an annular-shaped inertia disc within the housing with two slots extending outwardly from the inner wall of the housing;
a bearing between the inner wall of the housing and the inertia disc for rotation of the inertia disc within the housing;
silicone fluid between the disc and the housing;
two abutment plates connected to the inner wall of the housing and extending radially outwards into the slots in the inertia disc;
disc tuning means comprising four coil springs, each coil spring extending between the disc and one of the abutment plates perpendicularly to the one abutment plate;
a ring surrounding the hub and radially spaced-apart therefrom, the inner wall of the housing being mounted on the ring; and
housing tuning means comprising a plurality of spoke springs fixedly connected to the hub at a first end, extending radially outwards between the hub and the ring and fixedly connected to the ring at a second end.

4,160,391

AUXILIARY DRIVE MECHANISM

Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Dec. 22, 1976, Ser. No. 753,471
Claims priority, application United Kingdom, Jan. 15, 1976, 01572/76
Int. Cl.[2] F16H *37/06*
U.S. Cl. 74—661 1 Claim



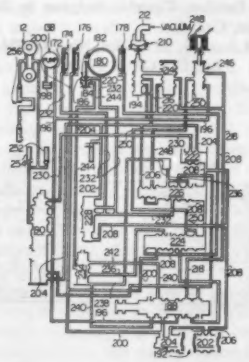
1. A conveyor chain tensioning and driving mechanism comprising a casing, an electrical chain drive motor mounted on the casing, a hydraulic clutch mounted within the casing and having a driving stage connected to be driven by the chain drive motor, and having a driven stage, a gear box having an input shaft drivingly connected to the driven stage of the hydraulically actuated clutch and having an output driving a conveyor chain, a gear wheel fixedly mounted on the driven stage of the clutch and positioned within the casing, the casing having an aperture, a housing having a mounting connected to the casing aroud the aperture, a shaft secured to the housing, an intermediate gear rotatable on and slidable along the shaft and extending through the aperture to drivingly engage the gear wheel, the intermediate gear being adapted for selective sliding into or out of meshing engagement with the gear wheel, means for sliding the intermediate gear, an auxiliary motor mounted on the housing and having an output shaft extending into the housing, a stepped pinion mounted on the output shaft for rotatation therewith, the pinion having first teeth for engaging the intermediate gear and having a second teeth, a stub shaft mounted in the housing in axial alignment with the auxiliary motor output shaft and having splines, an internally splined locking member slidable on the stub shaft for engaging the splines and the second teeth on the pinion and locking the pinion, whereby when the intermediate gear is slid into driving engagement with the pinion first teeth and the gear wheel, the auxiliary motor drives the gear wheel and gear box input shaft and gear box for tensioning a chain driven by the gearbox and whereby when the locking member is slid into engagement with the second teeth on the pinion, the pinion, intermediate gear, gear wheel input shaft gearbox and conveyor chain are held fixed, whereupon the intermediate wheel may be slid out of engagement with the gear, an electrical circuit connected to the chain drive motor, and circuit braking means connected to the circuit and connected to the intermediate gear sliding means for breaking the circuit to the chain drive motor when the intermediate gear sliding means slides the intermediate gear into engagement with the gear wheel and for re-establishing the circuit when the intermediate gear is slid out of engagement within the gear wheel.

4,160,392

AUTOMATIC POWER TRANSMISSION WITH DIRECT-DRIVE CLUTCH

Yoshio Sunohara; Kunio Ohtsuka, both of Yokohama; Wataru Ishimaru, Fujisawa; Takahiro Yamamori, Tokyo, and Toshio Shibuya, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Feb. 18, 1977, Ser. No. 770,031
Claims priority, application Japan, Feb. 20, 1976, 51-17791
Int. Cl.[2] F16H *47/00*
U.S. Cl. 74—732 8 Claims



1. In an automatic power transmission including a transmission input shaft, hydrodynamic torque transmitting means

connected between the transmission input shaft and the output shaft of an engine of an automotive vehicle, fluid-operated direct-drive clutch means combined with the hydrodynamic torque transmitting means and forming a variable-volume chamber into which a control fluid pressure is to be directed when the clutch means is to be coupled, a gear mechanism having a plurality of forward-drive gear ratios including a top-gear ratio and a hydraulic control system including first fluid circuit means for developing therein a first control fluid pressure when the top-gear ratio is in use and second fluid circuit means for developing therein a second control fluid pressure when any of said forward-drive gear ratios is in use,

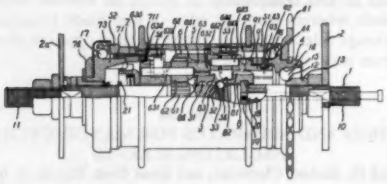
direct-drive control valve means responsive to the first and second control fluid pressures and operative to cause said direct-drive clutch means to be coupled substantially simultaneously when said top-gear ratio is produced in said gear mechanism under high-load operating conditions of the engine and to cause said direct-drive clutch means to be coupled at a retarded timing after the top-gear ratio has been produced in the gear mechanism under low-load operating conditions of the engine.

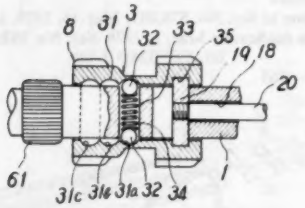
4,160,393

MULTIPLE-SPEED HUB FOR BICYCLES

Seiji Fukui, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 14, 1977, Ser. No. 787,489
Claims priority, application Japan, Apr. 21, 1976, 51/45864
Int. Cl.² F16H *3/44*
U.S. Cl. 74—750 B **11 Claims**





1. A multiple-speed hub for a bicycle, comprising

(a) a shaft fixable to a bicycle frame,

(b) a tubular driving member rotatably supported at an axial one side of said shaft,

(c) a hub shell rotatably supported between said driving member and axially the other side of said shaft,

(d) a transmission housed within said hub shell, said transmission changing the speed of the driving force to be transmitted from said driving member to said hub shell,

(e) a control means for operating said transmission, said control means including a control wire of the push-pull type, a rod positioned within the shaft and a bell crank having two arms pivotally attachable to the bicycle frame, one of said arms connected to said control wire and the other attached to said rod,

(f) a control member movable axially of said shaft by means of said control means, and

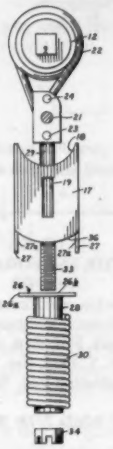
(g) a member within the hub for positioning the transmission and maintaining it at the position, said member being provided between said control member and either the shaft or the hub shell, which is axially unmovable, so that the position controlled by said control means is defined to a desired speed-change stage.

4,160,394

WRENCH

William H. Crumpacker, 1538 School Ave., Walla Walla, Wash. 99362

Filed Mar. 30, 1978, Ser. No. 891,701
Int. Cl.² B25B *13/52*
U.S. Cl. 81—64 **11 Claims**



1. A wrench adapted to turn a rotatable workpiece or tool about its central axis, comprising:

an elongated handle having an inner end and an outer end located along a longitudinal axis;

a bracket having inwardly facing surface means formed thereon for engagement against a workpiece or tool;

pivot means operably connecting said bracket to the inner end of said handle about a pivot axis perpendicular to said longitudinal axis;

loop means extending inwardly beyond said surface means of the bracket for encircling a workpiece or tool engaged by said surface means, said loop means comprising a flexible element having one end operably mounted to the inner end of said handle at one side of the pivot axis and its remaining end operably mounted to the inner end of said handle at the opposite side of the pivot axis;

and adjustment means operably mounted between said handle and said bracket for movably locating them relative to one another.

4,160,395

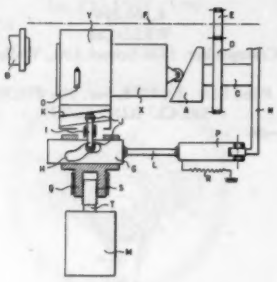
THREAD-CUTTING MACHINE

Georges C. Mulot, Carrieres sur Seine, France, assignor to Cri-Dan, Paris, France

Filed Oct. 5, 1977, Ser. No. 839,561
Claims priority, application France, Oct. 26, 1976, 76 32233
Int. Cl.² B23B *21/00*; B23G *3/08*
U.S. Cl. 82—5 **2 Claims**

1. A thread-cutting machine, of the type comprising a longitudinal carriage whose reciprocal movements are obtained from a first cam, called pitch cam, a transverse carriage carrying a tool and whose reciprocal movements are obtained from a second cam, called forward and backward movement cam, and means for ensuring the progression of the tool towards the work piece during successive threading cuts, characterized in that the tool progression means are formed by a numerical

control motor capable of ensuring the transverse movement of the forward and backward movement cam and a third cam operatively connected between the pitch cam and forward and



backward movement cam for synchronizing the reciprocal movement of the forward and backward movement cam with the pitch cam.

4,160,396

APPARATUS FOR THE PERFORATION OF TRACKS OF GOODS

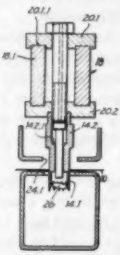
Peter Matzner, Winnenden, and Ehrhart Schulze, Fellbach, both of Fed. Rep. of Germany, assignors to Felix Stiegler Maschinenfabrik, Stuttgart, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,436

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2716278

Int. Cl.[2] B26D *7/18*; B29C *17/10*

U.S. Cl. 83—100 **12 Claims**



1. An apparatus for perforation of tracks of goods which are transportable substantially in their plane, particularly of thermoplastic synthetic material foils, comprising

at least one sleeve-shaped hollow punching tool adapted to be moved back and forth relative to the track of goods perpendicularly to the plane of transportation and parallel to its longitudinal axis,

an ejector pin coaxially disposed and engaged in said hollow punching tool and adapted to discard stamping cuttings,

a stationary first carrier means for carrying the track of goods, said first carrier means being arranged on a side of the track of goods which faces away from said ejector pin, said first carrier means extending transversely to the direction of transportation thereof,

a second carrier means for operatively carrying said ejector pin, said second carrier means being disposed parallel to said first carrier means and extending over the entire width of the latter,

said second carrier means carries said punching tool apart from said ejector pin, said second carrier means for being moved parallel to its longitudinal axis in a forward stroke with a velocity exceeding the accelerated rate of fall in the gravitational field of the earth toward said stationary first carrier means of the track of goods, and

said ejector pin being guided coaxially in said punching tool and freely moveably mounted therein limited with such an axial play that said ejector pin can push the stamping cuttings out from said punching tool.

4,160,397

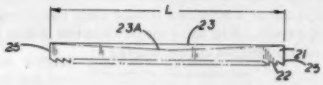
SAW BLADE CONSTRUCTION AND METHOD OF MAKING SAME

Milo Bertini, 679 Garden St., Trumbull, Conn. 06611

Filed Oct. 17, 1977, Ser. No. 842,618

Int. Cl.[2] B27B *33/06*

U.S. Cl. 83—661 **10 Claims**



1. A method for making an endless band saw blade comprising the steps of:

forming a blade stock with a plurality of cutting teeth to define a cutting edge,

shaping the back edge of said blade opposite said cutting teeth whereby said back edge is inclined in opposite directions relative to said cutting edge from an intermediate point on said back edge,

and connecting the opposed edges of said blade in abutting end to end relationship to define an endless band saw blade wherein the back edge of said blade progressively diverge relative to said cutting teeth in opposite direction from said intermediate point.

4,160,398

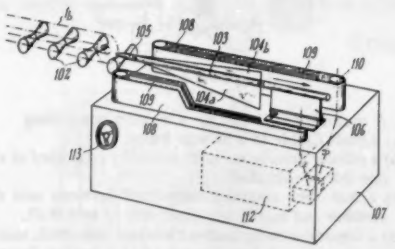
METHOD AND APPARATUS FOR MANUFACTURE OF INSULATING SLEEVES

Bernard H. Bichot, Clermont, and René Gest, Rantigny, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation of Ser. No. 578,087, May 16, 1975, abandoned. This application Mar. 1, 1978, Ser. No. 882,441

Int. Cl.[2] B26D *3/08*

U.S. Cl. 83—865 **4 Claims**



1. Apparatus for making longitudinally slit fibrous sleeves including means for feeding sleeves to be slit in a feed path; means for slitting the sleeves in said path; and means for supplying sleeves to the feeding means; the supply means including means for delivering separate sleeves endwise and in end-to-end relation into the feed path of the feeding means; the slitting means comprising a centering rod adapted to engage and pass through the bore of sleeves being slitted, the rod carrying a slitting knife having a slitting edge inclined with respect to the feed path and positioned to enter the interior of the sleeves when they are advanced in said feed path and form

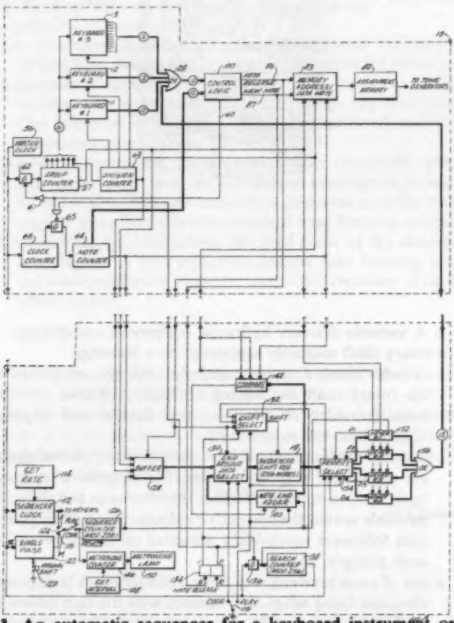
a radial slit in the wall of the sleeves, the slitting knife having a leading end and a trailing end, and supporting means for the centering rod and slitting knife, the supporting means being connected with the centering rod downstream of the slitting knife and lying in the plane of the knife thereby providing for projecting of the supporting means radially through the slit formed in each sleeve by the knife carried by the centering rod; and the feeding means including means for advancing the sleeves sequentially in end-to-end relation comprising a pair of conveyor belts having conveyor runs lying in planes parallel to and spaced at opposite sides of the slitting knife to engage and grip opposite outside surfaces of the sleeves, the conveyor runs in engagement with the sleeves being driven in a direction from the leading end of the knife to the trailing end of the knife and the conveyor runs in engagement with the sleeves being of sufficient length to extend throughout the length of and beyond the knife.

4,160,399

AUTOMATIC SEQUENCE GENERATOR FOR A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Mar. 3, 1977, Ser. No. 773,804
Int. Cl.[2] G10F *1/00*
U.S. Cl. 84—1.03 **14 Claims**



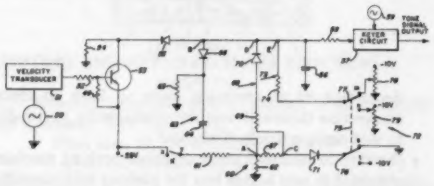
1. An automatic sequencer for a keyboard instrument on which each key operates a switch for generating an on-off signal which indicates when the associated key is depressed and released for initiating and terminating a musical note generated by a tone generator when the key is respectively depressed and released, the sequencer comprising: a sequencer memory for storing data identifying the notes to be played by the sequencer, means responsive to the key-operated switches when one or more keys are depressed during a coding mode of operation for loading the sequencer memory with a data word for each depressed key, each data word identifying one of the depressed keys, time generating means for counting the musical beats of the notes played by operation of the keys, said means responsive to the key-operated switches, including means for storing the count condition of the time generating means at the time the keys are depressed with each word loaded in the sequencer memory, the count condition indicating the relative beat time at which the associated key identified by the data word was depressed, and means responsive to the release of any of the depressed keys for storing the count condition of the time generating means with the word in the sequence memory associated with the released key, the count condition indicating the relative beat time at which the associated key identified by the data word was released.

4,160,400

TOUCH RESPONSIVE KEYING UNIT FOR ELECTRONIC MUSICAL INSTRUMENTS

Ray B. Schrecongost, Park Ridge, Ill., assignor to Marmon Company, Chicago, Ill.

Filed Sep. 29, 1975, Ser. No. 617,538
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.13 **26 Claims**



1. An apparatus for use in an electronic musical instrument having a plurality of juxtapositioned keys forming a keyboard and a tone circuit to produce a different tone signal output corresponding to the depression of each of said keys comprising:

source means for providing an AC signal;

a velocity transducer connected to said source means and to said keys and comprising:

capacitor means having a stationary plate and a movable plate for passing said AC signal in proportion to the impulsive force applied to one of said keys during depression by the instrument player;

linking means responsive to said keys for momentarily contacting said movable plate of said capacitor means and transferring said impulsive force applied to one of said keys to said movable plate;

said linking means after momentarily contacting said movable plate disengages from said movable plate regardless of maintained key depression by the instrument player;

said movable plate responsive to said linking means temporarily overlaps said stationary plate if said impulsive force exceeds a minimum value and said overlap is in proportion to said impulsive force and independent of maintained key depression by the instrument player whereby the value of capacitance increases with the degree of plate area overlap; and,

circuit means responsive to said passed AC signal for generating a voltage signal envelope to control said tone circuit.

4,160,401

STRING VIBRATION TRANSDUCER BRIDGE FOR ELECTRIC STRINGED INSTRUMENTS

Michiaki Tomioka, Koufu, Japan, assignor to Chushin Gakki Seizo Kabushiki Kaisha, Nagano, Japan

Filed Oct. 12, 1977, Ser. No. 841,366
Claims priority, application Japan, Dec. 29, 1976, 51-160007
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.16 **6 Claims**

1. A string vibration transducer bridge for an electric instrument having strings comprising:

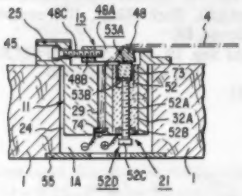
a bridge box;

a plurality of independent string tension mechanisms provided side by side in said bridge body and which are

adjustably movable along the direction of said string, said string tension mechanism further including a plurality of independent electrically conductive string supporting electrode parts independently slidably movable in said bridge body along the direction of said strings and independently rotatable along the direction perpendicular to said string;

a plurality of independent piezoelectric transducers provided in said bridge box which each engage with an undersurface of an electrode parts to form an electrical connection therewith and are substantially perpendicular to said tension mechanisms; and

a plurality of piezoelectric transducer pushing mechanisms provided in said bridge box for pushing said piezoelectric transducer against said electrode parts whereby the tension of said string maybe set by both said string tension mechanism and said transducer pushing mechanism and the vibration of each string is independently sensed.



4,160,402

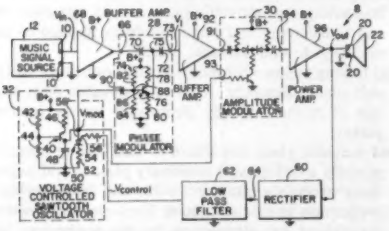
MUSIC SIGNAL CONVERSION APPARATUS

Louis A. Schwartz, 35 E. 9th St., Derby, Conn. 06418

Filed Dec. 19, 1977, Ser. No. 861,682

Int. Cl.[2] C10H *1/02*

U.S. Cl. 84—1.24 **4 Claims**



1. Apparatus for converting an input music signal composed of note signals of generally constant frequency having envelopes characterized by a relatively rapid rise time and a relatively slow fall time to an output music signal composed of note signals having a frequency generally constantly increasing over the duration of each note signal and having envelopes characterized by a relatively slow rise time and a relatively rapid fall time, said apparatus comprising: an input port adapted to be coupled to a source for said input music signal; an output port; and modulator means having an input terminal coupled to said input port for simultaneously modulating both the amplitude and phase of said input music signal in accordance with a modulation signal, said modulator means having an output terminal coupled to said output port; oscillator means for generating a modulation signal of sawtooth shape; said oscillator means being coupled to said modulator means for supplying said modulation signal thereto, said modulator means being configured to convert said input music signal to said output music signal in response to said modulation signal.

4,160,403

VARIABLE DELIVERY HYDRAULIC EQUIPMENT

Kinzo Takagi, 4-15, 5-chome, Kurichara, Niiza-shi, Saitama-ken, Japan

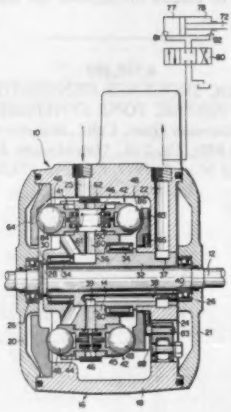
Division of Ser. No. 665,194, Mar. 9, 1976, Pat. No. 4,086,845.

This application Jan. 11, 1978, Ser. No. 868,574

Claims priority, application Japan, Mar. 14, 1975, 50-30917

Int. Cl.[2] F01B *3/10, 13/04*

U.S. Cl. 91—483 **7 Claims**



1. A variable delivery hydraulic equipment, comprising:

a rotary shaft rotatably supported on a housing;

a cylinder block disposed coaxially with and connected to the rotary shaft and having a plurality of axial cylinder bores provided on the periphery thereof and disposed coaxial with the rotary shaft;

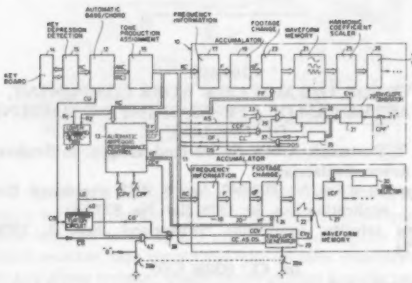
a plurality of plunger assemblies each having a pair of plungers oppositely disposed within the respective cylinder bore, so as to define a chamber therebetween and slideably movable within the respective cylinder bore, and a pair of cam followers revolvingly mounted on the outer end of each plunger; and,

a pair of cams between which the cylinder block is disposed, the cams being adapted to contact with the cam followers of the plunger assembly to impart a plurality of reciprocatory movements in one cycle to the opposite plungers, each having a cam surface substantially perpendicular to the rotary shafts, and being so designed as to impart different and ever-changing moving speeds to the opposite plungers respectively, in all phase positions except when the moving speeds of both plungers are zero, one of which being swingable relative to the other cam by a piston-cylinder assembly adapted to be operated by an operational fluid within the equipment and being free with respect to the rotary shaft and the housing, and the other cam being fixed to the housing, said swingable cam having a radial groove at the side on which it does not face the cam follower and said piston-cylinder assembly having an operating element fixedly mounted on a piston rod and fitted into the radial groove of the swingable cam.

4,160,404
ELECTRONIC MUSICAL INSTRUMENT

Shigeru Yamada, and Eiichiro Aoki, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 21, 1977, Ser. No. 844,463
Claims priority, application Japan, Oct. 29, 1976, 51/130187
Int. Cl.[2] G10H *1/02, 5/10*
U.S. Cl. 84—1.26 **7 Claims**

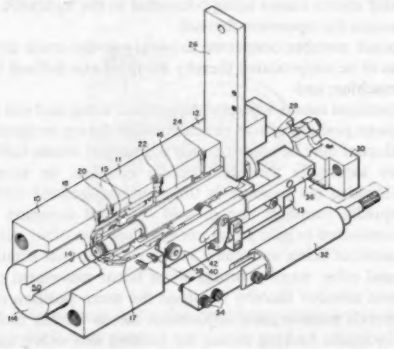


1. An electronic musical instrument comprising:
a plurality of keys;
key identification information generating means responsive to said keys for generating key identification information;
a plurality of musical tone forming systems each producing musical tone signals according to the same key identification information from said key identification information generating means; and
means for controlling the simultaneous or sequential order and the envelope shape of the musical tone signals formed by one system independently from, and so as to differ with respect to each of the other musical tone forming system;
the circuitry for establishing the tone color of the musical tone signals in the respective musical tone forming systems being different from the tone color circuitry of each other system.

4,160,405
LIQUID PROPELLANT GUN, POSITIVE DISPLACEMENT SINGLE VALVE

Steven E. Ayler, China Lake, and John W. Holtrop, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 21, 1978, Ser. No. 879,555
Int. Cl.[2] F41F *1/04*
U.S. Cl. 89—7 **10 Claims**

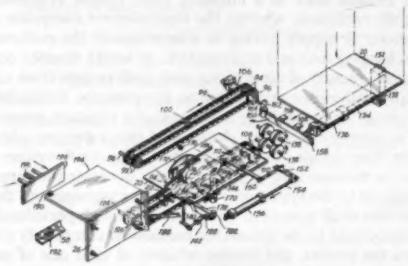


1. An injection system for a liquid propellant gun comprising:
a chamber for receiving propellant and oxidizer liquids;
a receiver connected to said chamber;
a manifold within said receiver and having passages in fluid communication with said chamber;
a valve mounted within said manifold for selective movement between two positions, one position providing fluid communication between said passages in said manifold and said chamber and one position in fluid sealing relation between said passages in said manifold and said chamber;
a piston slidably mounted within said valve and configured relative to said valve to form two recesses therebetween; and
actuation means operatively connected to said piston and said manifold for selectively moving said manifold means to said fluid communication position and to move said piston so as to change the dimensions of said two recesses when said valve in said fluid communication with said chamber, whereby the contents of said recesses may be transferred to said chamber.

4,160,406
METHOD AND APPARATUS FOR ERECTING A CARTON

Ulrich G. Nowacki, Leisure City, Fla., assignor to International Paper Company, New York, N.Y.

Filed Jun. 21, 1978, Ser. No. 917,483
Int. Cl.[2] B31B *1/06, 1/26, 1/62*
U.S. Cl. 93—36.3 **15 Claims**



1. A process for erecting and sealing a folded carton blank comprising four side panels joined at opposite edges and having two bottom side flaps and two bottom end flaps each of which is joined respectively to one of said side panels, the steps comprising: positioning a plurality of said carton blanks in a blank feeding station of a carton erecting and sealing machine to form a vertical column with each of said carton blanks lying in a horizontal plane; feeding in timed sequence the lowermost carton blank from said vertical column of carton blanks into a pinch roll driving means; driving said carton blank longitudinally through said erecting and sealing machine into a carton erecting and folding station; erecting said carton blank by applying a turning moment to the trailing side panel of said carton blank while maintaining the lower side panel of said carton blank stationary in a horizontal plane; driving said erected carton blank longitudinally through said erecting and sealing machine, sequentially folding the trailing bottom end flap and then the leading bottom end flap to a plane normal to the plane of the side panel to which each of said trailing and leading bottom flaps is respectively connected, partially folding said upper and lower side flaps toward said folded trailing and leading bottom end flaps, applying adhesive material between the surfaces of said bottom end flaps facing said bottom side flaps, and bringing said erected and partially folded carton blank to rest against squaring stops in a sealing station in said erecting and sealing machine; driving said partially folded carton blank transversely clear of said squaring stops and against a fixed anvil in said sealing station whereby said bottom side flaps are folded in sealing relationship against said bottom end flaps; holding said bottom side flaps and said bottom end

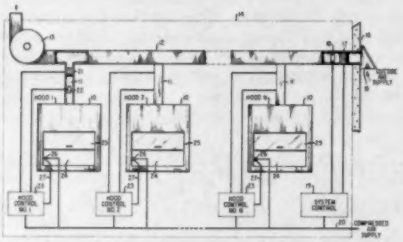
flaps in sealing relationship until said adhesive material has adhered said bottom end flaps to said bottom side flaps; and ejecting said completed erected and sealed carton from said erecting and sealing machine.

4,160,407

VENTILATING SYSTEM

Arthur Duym, Fanwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 18, 1977, Ser. No. 852,663
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 R **2 Claims**



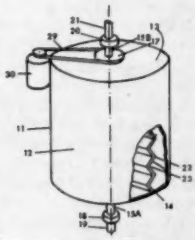
1. A ventilating system for an enclosure, said enclosure containing a plurality of ventilating hoods, each connected by a hood exhaust duct to a common draft system exhausting outside the enclosure, wherein the improvement comprises an atmospheric air supply having its source outside the enclosure and discharging into said draft system, an intake damper controlling the amount of air entering said draft system from said air supply and means responsive to the pressure within said draft system for maintaining a substantially constant pressure in said system by opening or closing said intake damper whenever the flow of air from the hoods to the draft system is reduced or increased, so as to increase or decrease the supply of outside air to the system in corresponding amounts and thus maintain the draft system in balance even though periodically hoods connected to the system are partially or completely shut off from the system, and further wherein at least one of said hoods is in enclosed hood having an access window equipped with a closure and wherein the hood exhaust valve associated with said hood is responsive to a pressure sensor in the corresponding hood exhaust duct between said valve and said hood to maintain a set pressure in said duct.

4,160,408

APPARATUS FOR TREATMENT OF PUMPABLE MATERIALS

Ole P. Ulvestad, Nyheimsveien 45, N-7058 Jakobsli, Norway

Filed Dec. 1, 1976, Ser. No. 740,935
Int. Cl.[2] A47J *37/00*
U.S. Cl. 99—348 **6 Claims**



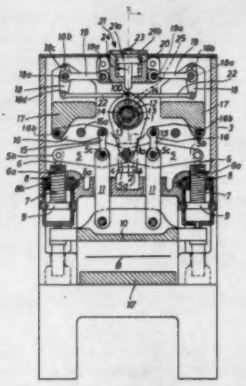
1. Apparatus for the treatment of pumpable materials, such as foodstuffs and fodder, which comprises a cylindrical container in which the bulk material is to be subjected to at least a treatment selected from at least one of pressure and heat, said container having side and end walls and an axially mounted, radial wall disposed closely against said side and end walls, said radial wall having a shaft having the supply and removal of said material on opposite sides of said wall, said wall and said container being rotatable relative to each other enabling components of said material to remain substantially at rest relative to said wall during the treatment.

4,160,409

DRIVE FOR THE MOVABLE WORK COMPONENT, SUCH AS THE RAM OF A PRESS, STAMPING MACHINE OR THE LIKE

August T. Portmann, Arbon, Switzerland, assignor to Bruderer AG, Arbon, Switzerland

Continuation of Ser. No. 602,047, Aug. 5, 1975, abandoned. This application Jan. 30, 1978, Ser. No. 873,642
Claims priority, application Switzerland, Sep. 3, 1974, 11979/74
Int. Cl.[2] B30B *5/00*
U.S. Cl. 100—257 **3 Claims**



1. A punch press machine comprising:

a machine housing;

a crank drive mounted within the machine housing and including a crankshaft;

hydraulic drive means connected to drive the crankshaft;

source means for providing hydraulic fluid under pressure, said source means being connected to the hydraulic drive means for operation thereof;

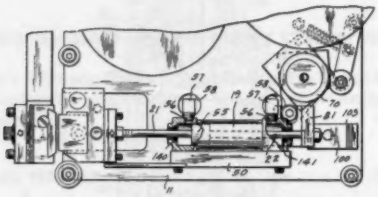
a punch member connected drivingly to the crank drive so as to be reciprocated thereby along an axis defined by the machine; and

adjustment means whereby the position along said axis of the mean position of said punch member during reciprocation thereof may be adjusted, said adjustment means including an externally threaded spindle member, an internally threaded nut member in threaded engagement with said spindle member, one of said threaded members being connected to said punch member and the other threaded member being so located in the machine that rotation of said other member brings about linear movement of said one member thereby to adjust the mean position of said punch member, said adjustment means further including hydraulic locking means for locking said other member against rotation, said hydraulic locking means being connected to said source means for operation by hydraulic fluid provided thereby.

4,160,410
MARKING DEVICE UTILIZING DUAL ROD POWER CYLINDER

Robert Fichter, Woodridge, Ill., assignor to Norwood Marking & Equipment Co., Downers Grove, Ill.

Filed Oct. 25, 1977, Ser. No. 845,044
Int. Cl.[2] B41F 17/00, 1/44
U.S. Cl. 101—41 13 Claims

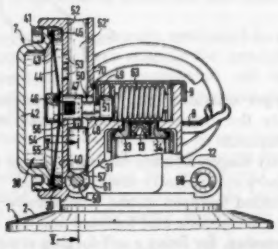


1. An imprint marker device utilizing transfer tape comprising: a movable marker head having raised indicia thereon, the head movable towards and away from an imprint station, a frame member, tape supply and take-up reels rotatably carried by said frame member, guide means guiding transfer tape from the supply reel to the take-up reel across the imprint station, said guide means carried by said frame, a rotatable tape drive roll and opposed spring biased idler roll carried by said frame with said tape passing between said rolls, a pneumatic power cylinder carried by said frame having first and second moving power rods projecting from opposite ends thereof, said first rod connected to said marker head to move the same, said second rod operatively connected to said drive roller to rotate the same to advance said tape, means connecting said drive roll to said take-up reel whereby rotation of the drive reel rotates said take-up reel and said power arms commonly operated by said pneumatic power cylinder whereby when one power arm is projected from said cylinder the other power arm is drawn into said cylinder.

4,160,411
SOUND SIGNAL BODY FOR GENERATING UNDERWATER SOUND SIGNALS

Adolf Weber, Neunkirchen; Erhard Münster, Winkelhaid, and Dieter Buckley, Nüremberg, all of Fed. Rep. of Germany, assignors to Diehl, Nüremberg, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,459
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1976, 2645914
Int. Cl.[2] F42B 22/20, 27/00
U.S. Cl. 102—7 9 Claims



1. A sound signal body, for generating underwater sound signals, which comprises:

an explosive body;

an explosive charge arranged within said explosive body;

detonator means arranged within said explosive body;

a pyrotechnical delay composition associated with said detonator means;

a hammer associated with said sound signal body and movable from a first position representing a safety position to a second position representing a striking position for igniting said composition;

spring means associated with said sound signal body and said hammer for constantly urging said hammer into said striking position;

a locking mechanism associated with said hammer and operable to arrest said hammer in the safety position and to release said hammer so that said spring means moves said hammer into said striking position;

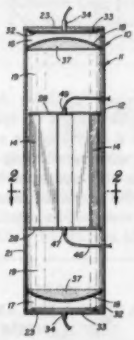
a hydraulic pressure switch associated with said sound signal body and including a diaphragm, said pressure switch being operable in response to a specific fluid pressure to permit said locking mechanism to release said hammer,

said hydraulic pressure switch including a pressure chamber, inlet means for connecting said pressure chamber to the environment, and a relelase bolt connected to said diaphragm and movable thereby into different control positions to control said locking mechanism, said diaphragm being locatetd in said pressure chamber, said locking mechaniam comprising a blocking bolt and a locking slide, said locking slide being operable to arrest said hammer in the safety position, said blocking bolt being arranged between said release bolt and said locking slide and being axially displaceable by the latter out of a locked position into an unlocked position in accordance with the control position of said release bolt.

4,160,412
EARTH FRACTURING APPARATUS

William H. Snyer, Littleton; Ralph E. Williams, and John Wisotski, both of Denver, all of Colo., assignors to Thomas A. Edgell and Roberta K. Tillinghast, both of Houston, Tex.

Filed Jun. 27, 1977, Ser. No. 810,072
Int. Cl.[2] E21B 43/11
U.S. Cl. 102—20 22 Claims



1. An improved earth fracturing apparatus of the kind having an elongated casing containing a pair of opposed end charges and a laterally directed intermediate charge, wherein the improvement comprises:

(a) said laterally directed charge being substantially centrally located along the axial length between the oppositely directed end charges for creating a central area of high pressure upon detonation;

(b) each of the end charges having a liner of reactive metal on its respective inwardly directed face for forming a metallic vapor upon detonation of the end charge;

(c) the end charges and the centrally located laterally directed charge being substantially spaced along the axis of the casing to form a void area between the central charge and each end charge, the void containing an oxidizer that

reacts with the metallic vapor upon detonation of the end charges to enhance the period of high pressure resulting from detonation of the end charges; and

(d) detonating means for exploding the centrally located charge and the end charges, the end charges being detonated substantially simultaneously at a time no sooner than the detonation of the centrally located charge, the shock waves of the end charge detonations meeting near the position of the centrally located charge to reinforce the pressures generated by explosion of the centrally located charge.

4,160,413

SHAPED EXPLOSIVE CHARGE DEVICE FOR UNDER WATER USE

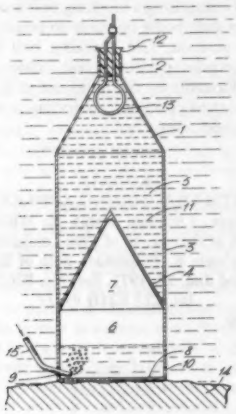
John J. Ridgeway, Aix-en-Provence, France, assignor to Imperial Chemical Industries Limited, London, England

Filed Sep. 21, 1977, Ser. No. 835,285

Claims priority, application United Kingdom, Oct. 20, 1976, 43516/76

Int. Cl.[2] F42B *3/08*

U.S. Cl. 102—24 HC **9 Claims**



1. A casing for a shaped explosive charge device for underwater use, said casing defining a compartment for the shaped explosive charge and a cavity space and stand-off space for said explosive charge, said spaces being in communication with ambient fluid pressure, and means for introducing gas under a pressure higher than the ambient pressure when said casing is submerged, so that water will be expelled and so that the gas will be retained in said spaces.

4,160,414

PROJECTILE HAVING A DELAY-ACTION FIRING MECHANISM

Suzanne Stockman, and Leon Stockman, both of Avenue des Aubépines, 156, 1180 Brussels, Belgium

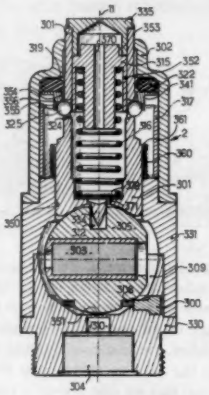
Filed Jun. 6, 1977, Ser. No. 803,859

Claims priority, application Belgium, Jun. 10, 1976, 167781; Mar. 31, 1977, 176279

Int. Cl.[2] F42C *15/02, 15/24*

U.S. Cl. 102—65.2 **20 Claims**

1. A rifle grenade having an orifice or passage with edges leading to the explosive charge thereof, comprising a tail tube and a nose fuze provided with a delay-action firing mechanism including a striker arranged along the axis of the grenade and protruding beyond the front of the grenade, a detonator carried by a barrel and associated with the striker so as to be fired when the front of the grenade meets an obstacle, a charge fired by the detonator and a striker blocking device with inertia unlocking on shooting of the grenade, the said device being intended to hold the striker and the detonator in a safety position so long as the grenade has not been fired and for a certain time after the shooting of the grenade, wherein the barrel is provided with an annular or otherwise suitably shaped element, made for example at least partially from stainless metal, attached to and protruding from the barrel to form a surface by



which the latter in safety position bears upon the edges of the orifice or passage leading to the explosive charge of the grenade, the said annular element, when the barrel is in its safety position, bearing upon a first stationary abutment preventing the barrel from rotating in the wrong direction when it is released by the striker.

4,160,415

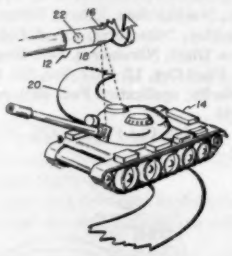
TARGET ACTIVATED PROJECTILE

Lewis C. Cole, Chester, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 5, 1978, Ser. No. 903,330

Int. Cl.[2] F42C *13/04;* F42B *13/10*

U.S. Cl. 102—214 **7 Claims**



1. A target activated spin stabilized projectile fired in a substantially flat trajectory against metal armored ground targets comprises:

a tubularly shaped housing having an ogive shaped forward end and a cylindrically shaped rear end;

double ended warhead means, transversely operatively disposed intermediate said forward end and said rear end of said housing, for firing a self-forging armor piercing fragment from one end of said double ended warhead means at said armored target in a direction normal to said flat trajectory of said projectile when said projectile passes directly over said target;

set back actuated radiometer means for detecting the presence of said target along a ground search pattern beneath

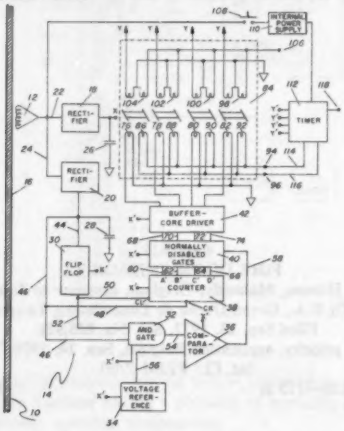
said flat trajectory of said projectile, and for initiating a firing signal to fire said double ended warhead means in response to radiation detection of said armored target when said armored target is aligned with one end of said double ended warhead means; and

set back activated detonator means for safing and arming said projectile during launch and for initiating said warhead means upon receipt of said firing signal from said radiometer means.

4,160,416
PROGRAMMED SELF-DESTRUCT SYSTEM FOR A MUNITION

Andrew J. Baracz, Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 20, 1978, Ser. No. 898,050
Int. Cl.² F42C *11/06*
U.S. Cl. 102—215 **5 Claims**



1. A device for electromagnetically encoding prior to launch an energy passive munition to self destruct after deployment in accordance with stored instructions which comprises:

a secondary receiving coil proximately positioned adjacent to an interior wall of said munition, for receiving signals from a high frequency external energy source;

first rectifier-capacitor means electrically coupled to said secondary receiving coil for energizing said device during a charging period;

second rectifier-capacitor means electrically coupled to said secondary receiving coil, for generating substantially square wave encoding pulse signals in response to high frequency programming pulses for said external energy source;

logic circuitry means electrically connected to said second rectifier-capacitor means adapted for generating binary coded output signals in response to said substantially square wave encoding pulse signals received from said second rectifier-capacitor means;

memory means electrically coupled to said logic circuitry means for storing said binary coded output signals of said logic circuitry means and for transferring said binary coded output signals to memory output terminals upon receipt of an interrogate pulse at memory interrogate terminals;

timer means for initiating said interrogate pulse upon deployment of said munition and for generating a self destruct signal to explode said munition in accordance with encoded information transferred from said memory means to said timer means;

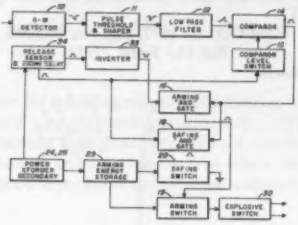
acceleration responsive switch means, electrically coupled to said secondary, receiving coil for closing an electrical circuit upon deployment of said munition; and

passive squib initiated internal power source means electrically connected in series with said acceleration responsive switch means and said timer means, for generating energy in response to receipt of a relatively short high frequency arming pulse after deployment of said munition from said secondary receiving coil, said internal power source means being adapted to start said timer means.

4,160,417
ARMING-SAFING SYSTEM FOR AIRBORNE WEAPONS

Ronald J. Fowler, Columbus, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1969, Ser. No. 823,242
Int. Cl.² F42C *15/12, 15/40, 13/04, 11/04*
U.S. Cl. 102—221 **7 Claims**



1. A system for arming an airborne weapon in time delayed relation with respect to the release of the weapon from an aircraft in flight, the aircraft being provided with an unmodulated gamma radiation source for irradiating a predetermined volume of space below the aircraft, comprising:

means for detecting gamma radiation;

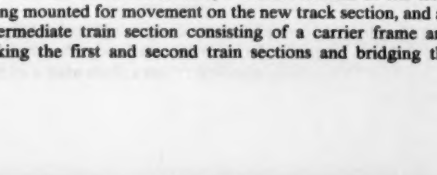
means for comparing the magnitude of the detected radiation to a predetermined radiation level and for generating a pulse when the radiation exceeds that level; and

means responsive to a pulse from said comparing means for initiating the arming sequence for said weapon.

4,160,418
MOBILE APPARATUS FOR CONTINUOUS TRACK RENEWAL

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Aug. 29, 1977, Ser. No. 828,337
Claims priority, application Austria, Oct. 15, 1976, 7719/76
Int. Cl.² E01B *27/11, 29/05*
U.S. Cl. 104—2 **6 Claims**



1. In a mobile apparatus for the continuous renewal of a track consisting of ties and two rails, which comprises a train of freight cars mounted for continuous movement along a right of way consisting of an old track section, a new track section and an intermediate right of way section wherein the track is renewed, a first section of the train being mounted for movement on the old track section, a second section of the train being mounted for movement on the new track section, and an intermediate train section consisting of a carrier frame and linking the first and second train sections and bridging the

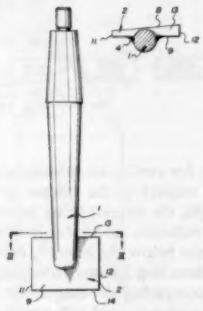
intermediate right of way section, the carrier frame having two ends respectively carried on undercarriages respectively running on the old and the new track sections, the carrier frame ends being mounted for pivoting about a substantially vertical axis in a plane substantially parallel to the track, and the train sections carrying equipment arranged to transport old and new ties, to remove old ties from the intermediate right of way section and to lay new ties thereat, and to lift and spread the rails in the intermediate right of way section and to guide the rails substantially without friction: the carrier frame consisting of two parts, a substantially vertical pivot coupling the two carrier frame parts together for pivotal movement in a plane substantially parallel to the track, and a device for pivoting the two carrier frame parts in said plane and for fixing the same in selected pivotal positions.

4,160,419

TAMPING TOOL

John K. Stewart, Lexington, S.C., assignor to Canron, Inc., New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,335
Int. Cl.[2] E01B *27/13*
U.S. Cl. 104—10 **2 Claims**



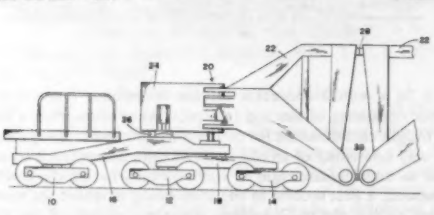
1. A tamping tool comprising a shank and a foot mounted on the lower end of said shank, said foot having a planar front face, a rear face, upper and lower faces and side edges spaced from said shank, one of said side edges being of greater thickness than the other and said upper and lower faces tapering gradually from said one side edge to said other side edge, whereby said tool is adapted for longer life.

4,160,420

ARTICULATED SCHNABEL CAR

Richard W. Hackbarth, Roseville; Douglas A. Puariea, St. Paul, and Philip J. Kramlinger, Roseville, all of Minn., assignors to The Maxson Corporation, St. Paul, Minn.

Filed Sep. 8, 1977, Ser. No. 831,366
Int. Cl.[2] B61D *3/16, 49/00*; B61F *1/10, 5/22*
U.S. Cl. 105—367 **6 Claims**



1. A schnabel-type railway car comprising a pair of separable end units adapted to be interconnected and to be connected to each end of a load carried therebetween in which each end unit comprises:

load support members;

a plurality of trucks connected together by span bolster members;

a torque box carried at a first end on said span bolster members, said torque box including a massive hinge at the other end adapted to engage the load support members, the pivot axis of said hinge forming a reduced longitudinal distance of pivoting between the end units;

load force transfer means at the first end of the torque box including a vertical pin rotatably carried by said span bolster and slidably inserted into said torque box so as to transfer horizontal forces and further including bearing pad means between said bolster members and said torque box so as to transfer vertical forces; and

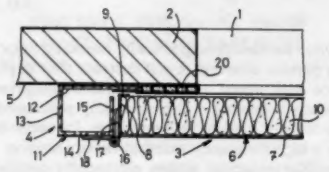
lateral position determining means on said bolster members connected to said hinge at said reduced pivot axis so as to adjust the lateral position of said reduced pivot axis.

4,160,421

FIRE DOOR ASSEMBLY

Hans D. Heinen, Malmedy, Belgium, assignor to Intellectual Trade Cy S.A., Grand-Duche de Luxembourg, Luxembourg

Filed Sep. 23, 1977, Ser. No. 835,921
Claims priority, application Belgium, Sep. 24, 1976, 75867
Int. Cl.[2] F23M *7/00*
U.S. Cl. 110—173 R **3 Claims**



1. In a fire-proof small door assembly for providing access to an enclosure such as a furnace, duct, tank, cistern or the like, the combination comprising:

(a) a fixed frame mounted on a wall of the enclosure around an access aperture in said wall and comprising a metal plate, said metal plate having a flat base positioned against the outer face of said wall around said aperture and secured to said outer face and two flanges, the first one of said flanges projecting perpendicularly from the base and the second of said flanges projecting perpendicularly from the first flange;

(b) a flat seal mounted on said outer face of said wall around said aperture partially between said wall and said base of said fixed frame;

(c) a door flap comprising a casing formed from a metal plate having edge portions which are bent twice at right angles in the same direction, said casing containing a block of insulating material, said block being continuously applied against said seal in the closed position of said door flap; and

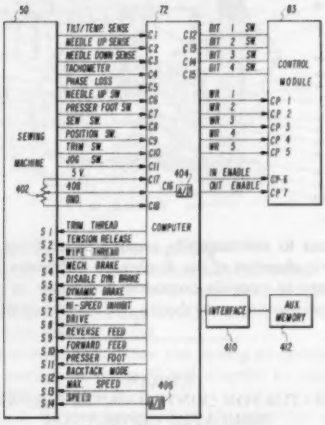
(d) means connecting said door flap with said fixed frame.

4,160,422

PROGRAMMABLE SEWING SYSTEM WITH AUXILIARY MEMORY

Warren A. Barber, Martinsville, and Henry A. Seesselberg, South Plainfield, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,505
Int. Cl.[2] D05B *19/00*
U.S. Cl. 112—121.11 6 Claims



1. In a programmable sewing system comprising;

a sewing machine having a plurality of manually and automatically operable components;

a computer having a memory, a plurality of input terminals coupled to said sewing machine for receiving thereat input signals indicative of operation of said components of said sewing machine and a plurality of output terminals coupled to said sewing machine for providing thereat output signals for controlling the operation of said components of said sewing machine;

manually actuated control means coupled to said computer for entering sewing instructions;

said sewing system having a first mode of operation selected by way of said control means wherein said computer receives at said plurality of input terminals, and retains in said memory, signals indicative of manual operation of said components of said sewing machine, including a count of the repetitive component operation of certain of said components, and a time duration for operation of certain others of said components;

said sewing system further having a second mode of operation selected by way of said control means wherein said computer provides said output signals for controlling the operation of said components of said sewing machine, including said count of said repetitive component operation of said certain of said sewing machine components and said time duration for operation of certain others of said sewing machine components according to said signals retained in said memory in said first mode of operation;

the improvement comprising:

an auxiliary memory unit; and

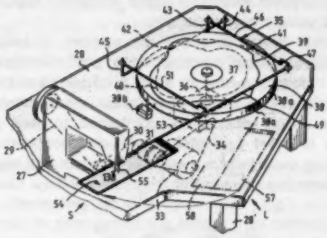
interface means operatively connecting said auxiliary memory unit to said computer for transferring information between said computer memory and said auxiliary memory unit.

4,160,423

DEVICE FOR MAKING SLIT FACINGS OF A GARMENT

Hans Scholl, Oberlinghausen-Lipperreihe, and Helmut Tiemann, Bielefeld, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Aug. 17, 1978, Ser. No. 934,543
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 11 Claims



1. A device for infolding margins of a binding strip, folding said strip about a longitudinally directed main fold line, sewing said folded binding strip to one edge of a slit of a shirt sleeve or a tubular garment and securing the area where the two edges of said slit meet, by means of a stitch row, said device comprising

a support,

a sewing machine having

a reciprocating needle,

a throat plate and

a workpiece press pad,

a workpiece receiving and folding unit, comprising

a binding strip receiving plate for supporting said strip with margins projecting therefrom and consisting of a left half and a right half pivotally connected in the longitudinal direction,

a defining blade arranged above said binding strip receiving plate and determining the form of said binding strip, and including a left blade half and a right blade half in swivel connection,

infolding blades cooperating with said defining blade, for folding said margins of said binding strip about the edges of said defining blade,

means for turning one of said halves of said binding strip receiving plate, one of said halves of said defining blade together with one half of said binding strip being clamped to said defining blade by said infolding blades about said longitudinally directed main fold line of said strip into a receiving position for said slitted shirt sleeve, and clamping said folded binding strip between said two halves of said binding strip receiving plate, and

means for retracting said infolding blades and releasing said edges to be sewn from said defining blade halves, and

means for moving said binding strip clamped to said shirt sleeve relatively to said needle of said sewing machine in order to stitch said infolded edges of said binding strip to said one edge of said slit and producing said stitch row for securing the area where said two edges of said slit meet.

4,160,424

STITCH COUNTER FOR A SEWING MACHINE

Robert C. Newell, Hillsdale, and Robert F. Kinning, Rutherford, both of N.J., assignors to Dan River Incorporated, Danville, Va.

Filed Feb. 13, 1978, Ser. No. 877,184
Int. Cl.[2] D05B *69/22, 69/20*
U.S. Cl. 112—275 6 Claims

1. In a sewing machine having a reciprocating needle actuated by a main shaft; a motor drivingly connected to said shaft;

and means to control the operation and speed of said motor, the improvements comprising:

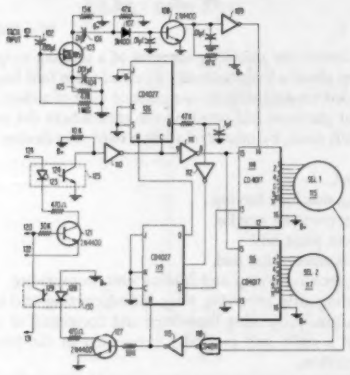
(a) pulse generating means driven by said main shaft, the number of pulses generated being proportional to the number of stitches of said sewing machine;

(b) electrical circuit pulse counting means to count the number of pulses generated by said pulse generating means;

(c) detecting means to detect the end of the cloth being sewn and generate an electrical signal when the end is detected, said generated electrical signal actuating said electrical circuit pulse counting means;

(d) selector means to select the number of pulses to be counted electrically connected to said electrical circuit pulse counting means so as to produce an output signal when the selected number of pulses are counted;

(e) reset means electrically connected to said detecting means to reset and enable said electrical circuit pulse counting means upon receipt of an electrical signal from said detecting means; and



(f) means responsive to electrical signals from said electrical circuit pulse counting means to produce an output signal which stops the sewing machine when the selected number of pulses have been counted, said means comprising:

(i) a NAMD gate electrically connected to the output of said selector means so as to produce an output signal when a signal is received from all selector means,

(ii) transistor means electrically connected to the output of said NAND gate such that the transistor means becomes conductive upon receipt of an electrical signal from said NAND gate; and

(iii) photo isolator means electrically connected to said detecting means and said transistor means such that upon receipt of an electrical signal from said transistor means, said photo isolator means becomes conductive and creates a return signal path from said detecting means to the motor, thereby causing said motor to stop.

4,160,425

FUEL SYSTEM FOR AQUATIC CRAFT

Robert S. Curtis, 93 Woodbury Rd., Huntington, N.Y. 11743

Continuation-in-part of Ser. No. 709,900, Jul. 29, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,385

Int. Cl.[2] B63B *35/00*

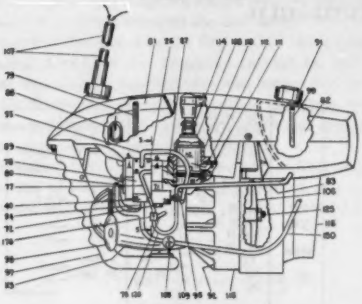
U.S. Cl. 115—6.1 **7 Claims**

1. An improved self-powered aquatic craft for moving objects and individuals through water of the type having an internal combustion engine mounted in a housing wherein a propeller is mounted on a rotating shaft, said propeller drawing in water through the sides of said housing and thrusting said water through suitably positioned passageways, wherein the improvement comprises:

(a) a diaphragm carburetor having an atmospheric chamber and a diaphragm cover;

(b) a metering diaphragm mounted within the diaphragm carburetor;

(c) an integral fuel pump built into said diaphragm carburetor;



(d) means to automatically remove water from the atmospheric chamber of the diaphragm carburetor; and

(e) means to provide corrosion protection to the craft's internal moving parts during periods of non-use.

4,160,426

APPARATUS FOR CONTINUOUSLY MARKING AN INSULATED CONDUCTOR

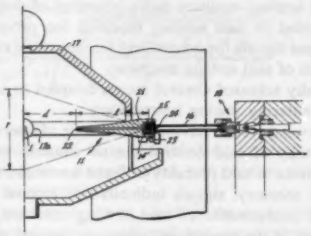
Percy Lambelet, Garbsen, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,346

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655479

Int. Cl.[2] B05C *5/00*

U.S. Cl. 118—323 **2 Claims**



1. Apparatus for continuously marking an insulated conductor which is being moved in a longitudinal direction and at a relatively high speed, comprising:

a nozzle made of light metal and having an internal, straight duct and an outer contour which tapers from a relatively thick portion adjacent to a nozzle entrance towards a thin nozzle tip;

means for positioning the nozzle in relation to a first axis in which the conductor is being moved longitudinally, so that the nozzle tip has a distance from the first axis of about 20 to 30 millimeters, the length of the nozzle between the tip and a second axis extending parallelly to the first axis being larger than first said distance, a ratio of said length to the said distance is between 6 and 7 to 5;

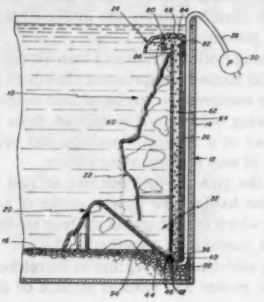
means connected for oscillating the nozzle about the second axis within a particular range; and

means for feeding ink or dye to said nozzle entrance.

4,160,427
AQUARIUM WATERFALL

Arthur J. Holbrook, Lynnfield, Mass., assignor to Rolf C. Hagen (USA) Corp., Mansfield, Mass.

Filed Jan. 20, 1978, Ser. No. 870,950
Int. Cl.[2] A01K *63/00, 64/00*
U.S. Cl. 119—5 10 Claims

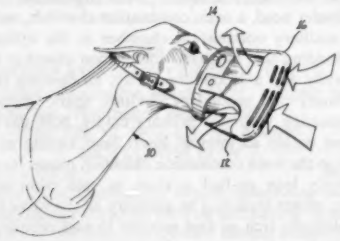


1. An aquarium waterfall comprising
a base having a well for collecting sand particles,
a vertical member secured to the base and having an outer surface that simulates a generally vertical rock formation over which water may fall,
a lift tube secured to the base and having an opening at the lowest portion of the well and adapted to accept sand particles from the well,
a pump and air hose mounted on the aquarium with the discharge end of the hose positioned to discharge air into the bottom of the lift tube,
a cap secured to the top of the vertical member and having an inverted trough on its lower surface with a discharge end positioned over and in front of the forward face of the vertical member, the upper end of the lift tube discharging into the inverted trough,
and a baffle at the discharge end of the inverted trough to direct the discharge of the lift tube downwardly over the face of the vertical member into the well in the base.

4,160,428
RACING MUZZLE FOR DOGS

Victor E. Wilkinson, 301 W. Cambridge, Phoenix, Ariz. 85003

Continuation-in-part of Ser. No. 873,788, Jan. 31, 1978. This application Sep. 28, 1978, Ser. No. 946,580
Int. Cl.[2] A01K *25/00*
U.S. Cl. 119—133 8 Claims

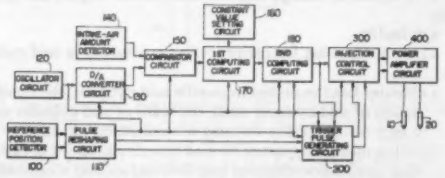


1. A muzzle for enhancing respiration of racing dogs, said muzzle comprising in combination:
(a) a rear guard piece for encircling the dog's upper and lower jaws forward of the dog's stop, said rear guard piece having a top, a bottom and opposed sides;
(b) band means extending from said rear guard piece for securing said muzzle upon the dog;
(c) a foward guard piece disposed forwardly of said rear guard piece for enclosing the distal end of the dog's upper and lower jaws, said forward guard piece having a vertical axis and a horizontal axis and defining substantially a U-shape in horizontal cross-section and wherein the legs of said U-shape are adjacent the respective sides of the dog's jaws and the base of said U-shape is forwardly proximate the dog's nostrils and distal end of the dog's jaws whereby, during forward movement of the dog, said U-shape defines an aerodynamic body for establishing a higher than ambient pressure environment adjacent said base and a lower than ambient pressure environment adjacent said sides;
(d) means for attaching said forward guard piece to said rear guard piece;
(e) said forward guard piece including:
i. a central member defining said base;
ii. intake aperture means disposed in said central member for channeling air directly into the dog's mouth in response to presence of the higher than ambient pressure environment, said first aperture means including a series of vertical slots approximately ⅛ inch wide and extending horizontally laterally from the center of said central member, said slots being approximately 2 inches long, whereby the width of said slots restricts the flow of particulate matter into said forward guard piece; and
(f) exhaust aperture means disposed within the sides of said muzzle for exhausting air out of said muzzle during exhalation by the dog in response to presence of the lower than ambient pressure environment;
whereby, said muzzle is aerodynamically structured to promote inhalation of fresh air and evacuation of exhaled air when the dog is racing.

4,160,429
ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Seiji Morino, Okazaki, and Hisasi Kawai, Toyohashi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 1, 1977, Ser. No. 812,597
Claims priority, application Japan, Aug. 8, 1976, 51-94117
Int. Cl.[2] F02B *5/02*
U.S. Cl. 123—32 EB 5 Claims



1. A fuel injection system for internal combustion engines comprising:
an electromagnetic injector for injecting fuel into an internal combustion engine during the opening thereof;
a reference position detector for generating a synchronizing signal at each time when the crankshaft of said engine rotates to a predetermined reference angular position;
means, connected to said reference position detector, for computing an injection interval in response to said synchronizing signal, said injection period being varied in accordance with the operating conditions of said engine and indicative of the fuel injection amount;
means, connected to said reference position detector, for computing a rotation interval between two said synchronizing signals successively generated by said reference position detector;
a subtracting circuit means, connected to said means for

computing the injection interval and said means for computing the rotation interval, for subtracting said injection interval from said rotation interval to thereby compute a differential interval therebetween;

a trigger circuit means, connected to said reference position detector and said subtracting circuit means, for generating a trigger signal when said differential interval passes after the generation of said synchronizing signal; and

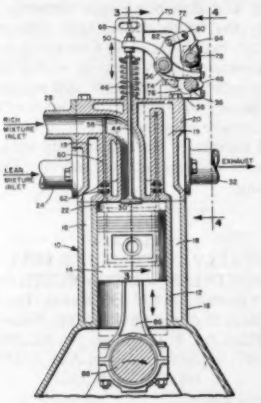
an injection control circuit means, connected to said means for computing the injection interval and said trigger circuit means, for opening said electromagnetic injector during said injection period in synchronism with said trigger signal, whereby start of fuel injection is varied in accordance with said operating conditions and termination of fuel injection is attained substantially at said predetermined reference angular position.

4,160,430

STRATIFIED CHARGE INTERNAL COMBUSTION ENGINE

John L. Bell, Rte. 1, P.O. Box 15, Severna Park, Md. 21146

Filed Dec. 1, 1977, Ser. No. 856,518
Int. Cl.[2] F02B *19/00*
U.S. Cl. 123—75 B **30 Claims**



1. A stratified charge internal combustion engine comprising:

a cylinder;

a piston mounting for reciprocating movement in said cylinder;

a cylinder head mounted to overlie said cylinder, the combination of said cylinder head, the walls of said cylinder and a face of said piston forming a combustion chamber;

dividing means supported by said cylinder head for dividing said combustion chamber into first and second combustion chambers;

actuator means connected to said dividing means for moving said dividing means between a retracted position in said cylinder head and an extended position in said combustion chamber for dividing said combustion chamber;

fuel supply means mounted on said cylinder head for supplying a rich air-fuel mixture to said first combustion chamber and a lean air-fuel mixture to said second combustion chamber;

ignition means mounted on said cylinder head adjacent said first combustion chamber for igniting the rich air-fuel mixture in said first combustion chamber which in turn ignites the lean air-fuel mixture in said second combustion chamber to drive said reciprocating piston.

29. In an internal combustion engine having a combustion chamber formed by the combination of a cylinder, a cylinder head and a four stroke reciprocating piston contained in said cylinder, said reciprocating piston having intake, compression, power and exhaust strokes, a method for stratifying the charge in said combustion chamber comprising the steps of:

introducing a movable septum into said combustion chamber at the start of the intake stroke of said reciprocating piston to divide said combustion chamber into first and second combustion chambers;

supplying a rich air-fuel mixture to said first combustion chamber and a lean air-fuel mixture to said second combustion chamber during the intake stroke of said reciprocating piston;

compressing both the rich and lean air-fuel mixtures in said first and second compression chambers respectively during the compression stroke of said reciprocating piston;

withdrawing said movable septum from said combustion chamber to a retracted position just prior to the power stroke of said reciprocating piston;

igniting the rich air-fuel mixture in said first combustion chamber to start the power stroke of said reciprocating piston which in turn ignites the lean air-fuel mixture in said second combustion chamber; and

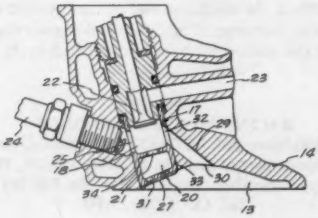
retaining said movable septum in its retracted position during the power and exhaust strokes of said reciprocating piston.

4,160,431

INSERT LINER FOR DIVIDED AUXILIARY COMBUSTION CHAMBER OF ENGINE

Shizuo Yagi, Asaka; Hiroshi Kogure, Tokorozawa, and Saburo Matsuoka, Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1978, Ser. No. 890,533
Int. Cl.[2] F02B *19/18, 75/02*
U.S. Cl. 123—75 B **3 Claims**

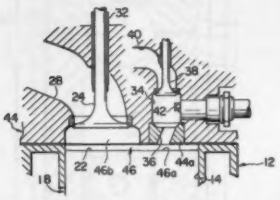


1. In an internal combustion piston engine, the combustion of: a cylinder head, a main combustion chamber, means forming an auxiliary combustion chamber in the cylinder head, means dividing said auxiliary combustion chamber into a primary cavity and a secondary cavity, an opening connecting said primary and secondary cavities, spark ignition means communicating with said primary cavity, both cavities being contained within an integral insert liner having an end wall exposed to the main combustion chamber, means for supplying a relatively lean air-fuel mixture to said main combustion chamber, means including an auxiliary intake valve for supplying a relatively rich air-fuel mixture to said primary cavity, a relatively long primary torch passage extending from said primary cavity to said main combustion chamber and having an outlet end positioned near the center of said main combustion chamber, and at least one relatively short secondary torch passage extending from said secondary cavity to said main combustion chamber and having an outlet end positioned adjacent a peripheral zone of said main combustion chamber.

4,160,432
INTERNAL COMBUSTION ENGINE HAVING MAIN AND AUXILIARY COMBUSTION CHAMBERS

Saburo Tsutsumi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 698,501, Jun. 22, 1976, Pat. No. 4,127,089, which is a division of Ser. No. 532,395, Dec. 13, 1974, abandoned. This application Aug. 15, 1978, Ser. No. 933,906
Claims priority, application Japan, Dec. 22, 1973, 49/3636; Dec. 22, 1973, 49/3638
Int. Cl.² F02B *17/00, 19/00*
U.S. Cl. 123—75 B 6 Claims



1. A flame ignition type internal combustion engine comprising:

a cylinder block having therein a cylinder bore;

a reciprocating piston movable in said cylinder bore;

a cylinder head positioned atop the cylinder block to form a main combustion chamber above said cylinder bore and having therein an auxiliary combustion chamber in the vicinity of said main combustion chamber, said main combustion chamber consisting of first and second volume portions which are different in form to each other and are bounded at the tops thereof by a lower end face of said cylinder head defining said main combustion chamber and at the bottoms thereof by the top face of said piston in the top-dead center position, said first volume portion being formed into a bathtub shape and being larger than said second volume portion, said second volume portion being formed between a flat section of said lower end face of said cylinder head and a flat section of said top face of said piston;

intake and exhaust valves operatively located at the top of said first volume portion and respectively associated with intake and exhaust ports formed in said cylinder head;

an auxiliary intake valve operatively located at the top of said auxiliary combustion chamber and associated with an auxiliary intake port formed also in said cylinder head;

a spark plug projecting into said auxiliary combustion chamber; and

means for forming a flame passageway providing communication between said main and auxiliary combustion chambers, said passageway having an outlet end open into said second volume portion of said main combustion chamber.

4,160,433
MODULATING AIR CONTROL VALVE

Donel R. Olson, Huntington Beach, Calif., assignor to Olson Engineering Inc., Huntington Beach, Calif.

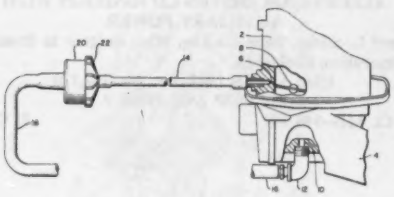
Filed Feb. 17, 1978, Ser. No. 878,640
Int. Cl.² F02M *23/04*
U.S. Cl. 123—124 R 14 Claims

1. In an internal combustion engine comprising an intake manifold maintained at partial vacuum and having an air injection port formed thereon, a carburetor having a throttle valve pivotally mounted therein, a vacuum advance port located adjacent said throttle valve to produce a variable vacuum source, a first conduit connected to said vacuum advance port, and a second conduit connected to said air injection port, a modulating air control valve connected to be controlled by said first conduit, said valve, under such control, supplying regulated amounts of ambient air to said second conduit to selectively introduce ambient air into said intake manifold in an amount regulated by engine vacuum, said valve comprising:

a valve body having an aperture therethrough with an annular seat;

orifice means for admitting ambient air into said valve;

diaphragm means for cooperating with said annular seat, said diaphragm being movable from said annular seat in



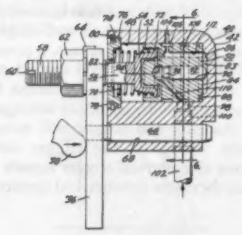
response to a pressure differential to permit ambient air to flow into said intake manifold; and

a unidirectional flow valve responsive, when said diaphragm admits ambient air into said valve, to the pressure differential between ambient and said intake manifold to allow air to flow into said intake manifold, but preventing hydrocarbon gases contained in said intake manifold from flowing toward said diaphragm or said orifice means.

4,160,434
EXCESS FUEL STARTING DEVICE FOR FUEL INJECTION ENGINES

Ignace J. Daborowski, Springfield, and Leon A. Galis, Ludlow, both of Mass., assignors to Ambac Industries, Inc., Springfield, Mass.

Filed Jan. 19, 1978, Ser. No. 870,761
Int. Cl.² F02D *1/04, 1/06;* F02M *39/00*
U.S. Cl. 123—140 FG 4 Claims



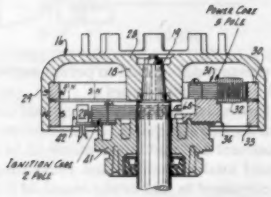
1. An excess fuel starting device for a fuel injection engine having a full load stop coacting with the engine throttle linkage to limit the fuel input thereto comprising, a hydraulic actuator operatively connected to the full load stop for movement thereof between a normal operating full load postiion and an excess fuel starting position, said actuator comprising a housing having a cylindrical bore therein, an excess fuel piston slidably disposed within said bore and forming a first chamber at one end thereof, means operatively connecting the full load stop plate with said excess fuel piston, spring means urging said excess fuel piston and stop plate into an excess fuel position, a coaxial bore within said excess fuel piston opening into said first chamber, a free piston slidably disposed within said coaxial bore and forming a second chamber at one end thereof, a fluid inlet port in said housing opening into said housing bore, conduit means connecting said fluid inlet port with a source of fluid pressurized during running of the engine, fluid passage means in said excess fuel piston connecting said fluid inlet port with said second chamber when said excess fuel piston is in the excess fuel position to thereby upon engine starting pressurize said second chamber, move said free piston against the end of said housing bore and move said excess fuel piston and full load

stop into a normal operating full load position, said fluid inlet port opening into said first chamber in the normal operating full load position of said excess fuel piston to pressurize said chamber and provide a holding force acting against said excess fuel piston while the engine is running.

4,160,435
ALTERNATOR DRIVEN CD IGNITION WITH AUXILIARY POWER

Richard L. Sleder, Fond Du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 15, 1977, Ser. No. 787,770
Int. Cl.[2] F02P *1/02*; H05B *41/36*
U.S. Cl. 123—148 CC **21 Claims**



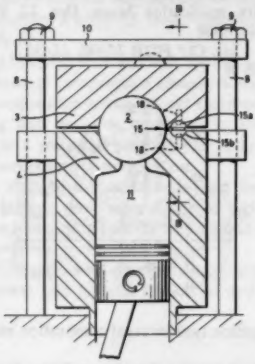
1. An alternator apparatus for a capacitor discharge ignition circuit having an ignition capacitor connected in a discharging circuit including a triggered switch means and for a separate power load, comprising a rotor means having first ignition magnet means having a plurality of circumferentially spaced magnets for providing an output for operating of the ignition circuit and a second power magnet means having a different and greater plurality of circumferentially spaced magnets for producing an alternating current power output, a common rotating support having an axis of rotation and having said first and second magnet means mounted thereon in axially close spaced relation, ignition charging and trigger coil means secured in radial alignment with said first ignition magnet means to produce time spaced trigger signals and coupled by leakage flux to said second power magnet means, a power coil means secured in radial alignment with said second power magnet means, and said second power magnet means including said plurality of magnets selected to produce leakage flux coupled to said ignition charging and trigger coil means creating a symmetrical ripple voltage in the trigger coil means and thereby maintaining symmetrical trigger signals from the trigger coil means and thereby a symmetrical ignition timing characteristic.

4,160,436
ROTARY VALVES

Ralph F. J. Flower, Littledean, Bath Rd., Devizes, Wiltshire, England

Filed Mar. 22, 1978, Ser. No. 889,130
Claims priority, application United Kingdom, Mar. 25, 1977, 12761/77
Int. Cl.[2] F01L *7/16*; F16K *25/00*; F16C *11/06*
U.S. Cl. 123—190 B **14 Claims**

13. A rotary valve for controlling the flow of inlet gases to and combustion products from the combustion chamber of an internal combustion engine, which valve comprises in combination an internal combustion engine cylinder having a cylinder axis, a base valve housing part formed as a part of said cylinder a cap valve housing part mounted on said base valve housing part with the join therebetween lying in a plane normal to said cylinder axis, the base and cap housing parts together defining a bore, an opening in the base housing part and communicating said bore to said cylinder, a rotatable valve member fitted within said bore and having at least one port which comes into and out of registration with said opening on rotation of said valve member about a rotational axis, an engine crankcase which slidably supports said cylinder for movement parallel to said cylinder axis, loading means anchored to said crankcase and bearing on said cap part to load said cap part against said base part, resilient means to urge said cylinder away from said crankcase thereby to maintain engagement between said loading means and said cap part, and an element interconnecting said base and cap parts which element allows relative hinging movement between said two housing parts

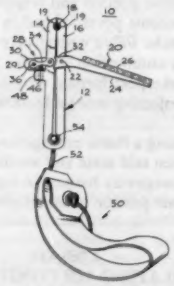


about an axis substantially parallel to said rotational axis of the valve member, said element also allowing relative rocking movement between said two housing parts for adjustment of the separation of said two housing parts differentially at the two ends of said bore defined by said housing parts, whereby said loading means applies a force to said cap part dependent upon the combustion forces in said cylinder to urge said valve member into engagement with said base part.

4,160,437
ARCHERY BOW STRING RELEASE DEVICE

James D. Fletcher, P.O. Box 218, Bodfish, Calif. 93205

Filed Dec. 12, 1977, Ser. No. 859,330
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—35 A **10 Claims**



1. An improved archery bowstring release device comprising, in combination:

a. a unitary bowstring-holding member in the form of a resilient one piece frame having an integral pair of spaced, opposed, engageable resilient clamp jaws;

b. a trigger member intersecting said frame and pivotably connected to one of said jaws; and,

c. a link pivotably connected to the other of said jaws and to said trigger member, whereby movement of said trigger member in a first direction acts through said link to force said jaws toward each other into a bowstring holding closed position, and whereby movement of said trigger member in the opposite second direction permits sudden

bowstring-releasing springing open of said jaws due to their inherent resiliency.

4,160,438

PROFILING APPARATUS FOR A DISK-LIKE ARTICLE HAVING A CYLINDRICAL FACE AND ROUNDED CORNERS

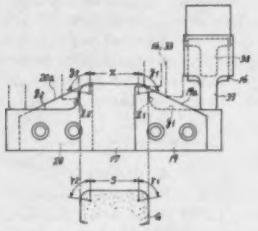
Michio Fujita, Nagoya, Japan, assignor to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Feb. 17, 1978, Ser. No. 878,888

Claims priority, application Japan, Feb. 17, 1977, 52/18904[U]

Int. Cl.² B24B 53/06

U.S. Cl. 125—11 TP 8 Claims



1. An apparatus for forming a cylindrical face and rounded corners joining both ends thereof on a disc-like article rotatably carried, having a traverse slide for movement in parallel relation with said cylindrical face, a cross slide slidably mounted on said traverse slide for movement in a direction transversal to the movement of said traverse slide, traverse feed means for reciprocatively moving said traverse slide, a profiling tool carried on said cross slide, a full form template having a straight portion and rounded corners joining both ends thereof, a non-extensible stylus fixed to said cross slide, and means for urging said cross slide to maintain contact between said stylus and said template, the improvement comprising;

first and second assistant templates fixedly disposed and respectively presenting outwardly downward gentle slopes from said rounded corners of said full form template,

extensible stylus means extensibly provided on said cross slide for contact engagement with said first and second assistant templates, and

stylus actuation means for moving said extensible stylus means so as to bring the extensible stylus means into contact with said first assistant template when said non-extensible stylus ascends one of said rounded corners of said full form template and with said second assistant template when said non-extensible stylus ascends the other of said rounded corners of said full form template.

4,160,439

CUTTING-OFF MACHINE FOR HARD BODIES

Jean Piat, La Varenne-St-Hilaire, France, assignor to Sotarem S.A., Fribourg, Switzerland

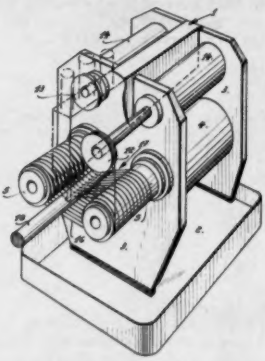
Continuation of Ser. No. 739,722, Nov. 4, 1976, abandoned. This application Feb. 24, 1978, Ser. No. 880,982

Claims priority, application Switzerland, Nov. 7, 1975, 14405/75

Int. Cl.² B28D 1/06

U.S. Cl. 125—16 R 5 Claims

1. A machine for cutting hard bodies, comprising a pair of rotatable drums with parallel axes, each said drum having a grooved peripheral surface, a motor individual to each said drum for reversibly driving said drums in rotation, an abrasive metal wire wound on both drums to produce at least one layer of parallel strands of wire extending between said drums, a feeding spool on which one end of said wire is secured, a receiving spool on which the other end of said wire is secured, means for reversibly driving in rotation said feeding and receiving spools, a support for an elongated hard body to be cut, said support comprising means for mounting said elongated body with its axis parallel to the plane of said layer and transverse to said strands of said layer, means for moving said



support toward said layer in a direction perpendicular to the plane of said layer, and means selectively to move said drums and motors simultaneously toward each other or simultaneously away from each other, thereby to permit said hard body to deflect said strands from said plane of said layer a predeterminably variable distance at different times during the cutting of said hard body.

4,160,440

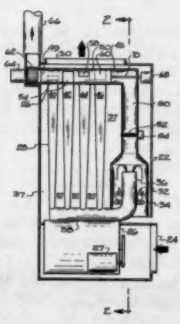
HEAT EXCHANGER

Andrew Barnickle, 608 Gideon Rd., Middletown, Ohio 45042

Filed Feb. 6, 1978, Ser. No. 875,325

Int. Cl.² F24H 3/02; F23L 11/00; F23N 3/00; F24H 3/00

U.S. Cl. 126—110 R 10 Claims



1. An improved heat exchanger of a type used in a heater comprising, in combination: means for producing heated gases at base of the heat exchanger; a plurality of vertical flues passing through the heat exchanger carrying the heated gases upward by natural draft; and a smoke pipe above the flues into which the heated gases are discharged; in which the improvement comprises:

a rotating damper means for cyclically opening and closing the flues, the damper means being interposed between the flues and the smoke pipe and having an opening means for cyclically opening and closing the flues in such order that at least one flue, at any one time, is open for venting the heated gases to the smoke pipe and recharging while at least one other flue is closed for temporarily holding the

heated gases to provide increased time for the transfer of heat in the heat exchanger; and

means for driving the rotating damper means.

4,160,441

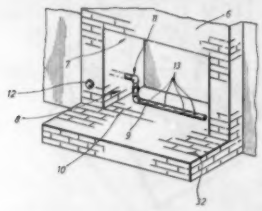
FIREPLACE UTENSIL

Frank M. Fuller, 5415 Verdant Way, Houston, Tex. 77069

Filed Jun. 2, 1977, Ser. No. 802,647

Int. Cl.[2] F24C *3/12*

U.S. Cl. 126—127 **7 Claims**



1. A fireplace utensil, for use in a log burning fireplace which has upper and lower portions, wherein said fireplace includes an elongated gas inlet pipe disposed with its longitudinal axis lying in a plane substantially parallel with the bottom portion of the fireplace, said gas inlet pipe having a plurality of gas jets disposed along its longitudinal axis and facing generally toward the upper portion of said fireplace for igniting the logs which comprises:

an elongated imperforate cover member having an upper portion and depending side portions, wherein the upper portion and the depending side portions of said cover member define a generally concave enclosure having a cross-sectional configuration which generally conforms to the cross-sectional configuration of said gas inlet pipe whereby undesired particulate matter from the burning logs is prevented from passing through the cover member and accumulating between the cover member and the gas inlet pipe;

an elongated handle attached to said cover member and extending outwardly from said cover member and of said fireplace; and

said fireplace utensil adapted to be placed upon the gas inlet pipe, with a longitudinal axis of said cover member being generally aligned with the longitudinal axis of the gas inlet pipe to prevent particulate matter from the burning logs from entering and blocking the gas jets of the gas inlet pipe and from accumulating within the gas inlet pipe.

4,160,442

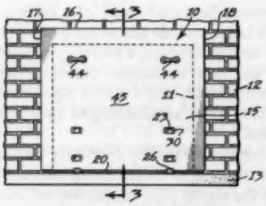
FIREPLACE COVER

Charles T. Fox, Signal Mountain, and Edward P. Graham, Chattanooga, both of Tenn., assignors to United States Stove Company, Chattanooga, Tenn.

Filed Dec. 7, 1977, Ser. No. 858,168

Int. Cl.[2] F24C *15/10*

U.S. Cl. 126—140 **9 Claims**



1. A cover for a fireplace having a front opening above a hearth, comprising:

(a) a flat sheet member of generally the same shape as, but of greater marginal extent in height and width than, the fireplace opening which said sheet member is adapted to cover,

(b) said sheet member having a front surface and a rear surface, an upper marginal portion, a horizontal bottom marginal portion, and opposite side portions,

(c) at least one foot member having a horizontal foot,

(d) means attaching said foot member to said sheet member so that said foot extends substantially normal to the plane of said sheet member adjacent said bottom marginal portion and rests upon the hearth for the free-standing support of said sheet member to cover said fireplace opening in operative position,

(e) a U-shaped reinforcing member having a bight portion and two arm portions,

(f) means securing said U-shaped reinforcing member against the rear surface of said sheet member so that said bight portion is generally adjacent to, but spaced from, the upper marginal portion of said sheet member, and each of said arm portions is spaced generally adjacent to, but spaced from, the opposite side portions of said sheet member.

4,160,443

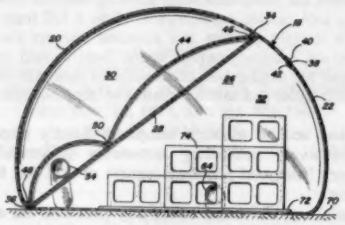
INFLATABLE SOLAR HEAT COLLECTOR

Dannie K. Brindle, 12797 W. 7th Ave., Golden, Colo. 80401, and Donald Y. Shanfelt, 12844 W. Iliff Ave., Lakewood, Colo. 80215, assignors to Donald Y. Shanfelt; Dannie K. Brindle; Dennis D. Kiser; David W. Armagast and Patrick J. Lynch, part interest to each

Filed Jul. 21, 1977, Ser. No. 817,992

Int. Cl.[2] F24J *3/02*; F24H *7/02*

U.S. Cl. 126—270 **20 Claims**



1. A solar heat collector including an elongated tubular housing formed of flexible film material defining an inflatable and flexible enclosure, said tubular housing including front and rear wall portions, said front wall portion being constructed of solar radiation transparent material, a panel of solar radiation absorbing material mounted in said housing and extending between opposite sides thereof dividing the interior of said housing into front and rear compartments between said panel and said front and rear walls, respectively, air inlet means operative to introduce pressurized air to be heated into said front compartment and said housing, air pass means operative to pass air from said front compartment into said rear compartment, the pressurized air introduced being received within the enclosure to inflate the tubular housing to structurally maintain said collector in an operative condition, the rear wall portion of said tubular housing adapted to contact a support surface from which said collector is supported, said solar radiation absorbing panel extending in a generally planar condition between opposite sides of said inflated tubular housing in generally spaced apart relation with respect to the portion of the rear wall contacting a support surface, and air outlet means operative to exhaust heated air from said rear compartment, said front compartment and air pass means including means insuring airflow through said front compartment at least substantially over the entire area of said solar radiation absorbing

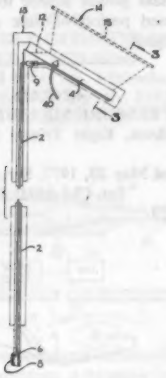
panel, said rear compartment and air pass means including means insuring airflow through said rear compartment and out of said collector.

4,160,444

OMNIDIRECTIONAL HEAT PIPE

Ralph A. Hamilton, 1836 Lake St., Glendale, Calif. 91201

Filed Jul. 22, 1977, Ser. No. 818,106
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **7 Claims**



1. Thermal energy transfer apparatus comprising:
- a first elongate conduit closed at both ends and adapted to hold a liquid at a first end thereof
- a second elongate conduit closed at both ends and adapted to hold a liquid at a first end thereof
- means defining a first unidirectional fluid passage from said first end of said first conduit to the second end of said second conduit;
- means defining a second unidirectional fluid passage from said first end of said second conduit to the second end of said first conduit;
- a normally-liquid fluid partially filling said first ends of each of said conduits; and
- means for first applying heat sufficient to vaporize said fluid at said first end of said first conduit and thereafter applying said heat to said first end of said second conduit, whereby any liquid condensate of said fluid tending to accumulate at the second end of said first conduit will be transferred back via said second unidirectional passage means as a result of the differential pressure established thereacross to the first end of said second conduit and thereafter any liquid condensate tending to accumulate at the second end of said second conduit will be transferred back via said first unidirectional passage defining means as a result of the differential pressure established thereacross to the first end of said first conduit.

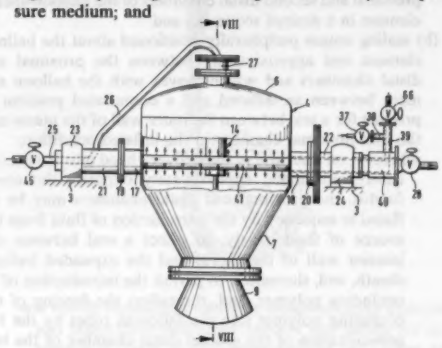
4,160,445

PRESSURE VESSEL AND METHOD FOR COOKING FOOD IN A PRESSURE VESSEL

Paul Kunz, Deishardtstr. 3, 5419 Döttesfeld, Fed. Rep. of Germany

Filed Feb. 25, 1977, Ser. No. 772,158
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610221
Int. Cl.² F24D *1/02*
U.S. Cl. 126—369.1 **11 Claims**

1. A pressure vessel for treatment of solid material with a pressure medium, comprising:
- means for supporting said pressure vessel for pivotal movement about a predetermined axis;
- a first vessel zone having a closable opening for introducing said solid material into said first vessel zone, said first vessel zone being disposed in an upper portion of said pressure vessel;
- a second vessel zone adjacent to said first vessel zone, said second vessel zone being disposed in a bottom portion of said pressure vessel;
- operating means for opening and closing said closable opening, said operating means being controlled by said pressure medium; and



- means separating said first vessel zone from said second vessel zone and having a plurality of openings therethrough, said openings having dimensions selected for allowing passage of liquid material but preventing passage of said solid material from said first vessel zone to said second vessel zone;
- whereby liquid material is allowed to flow through said separating means and between said first and second vessel zones during said pivotal movement of said pressure vessel and said solid material is retained in said first vessel zone.

4,160,446

APPARATUS FOR AND METHOD OF STERILIZATION BY THE DELIVERY OF TUBAL-OCCLUDING POLYMER

James E. Barrington, Woburn, Mass., assignor to Abcor, Inc., Wilmington, Mass.

Filed Aug. 12, 1977, Ser. No. 823,929
Int. Cl.² A61B *19/00*
U.S. Cl. 128—1 R **12 Claims**

1. An occluding-polymer delivery system for tubal sterilization by polymer occlusion of the fallopian tubes in a female, which apparatus comprises:
- (a) first, second and third elongated delivery tubes respectively and concentrically arranged, each tube having a one end and another end;
- (b) a resilient expandable balloon element secured about the one end of the third outermost delivery tube, the balloon element adapted to move between a relaxed noninflated condition and a pressurized inflated condition, the balloon element characterized by a first proximal chamber and a

second distal chamber, each chamber separately inflatable;

(c) a source of an occluding polymer;

(d) means to introduce the occluding polymer from its source into the outer end of the first innermost tube and to discharge the polymer from a discharge head at the one end of the innermost tube;

(e) a discharge head at the one end of the innermost tube;

(f) a source of pressurized fluid;

(g) means to introduce the pressurized fluid into the second and third tubes to effect the separate expansion of the first proximal and second distal chambers of the balloon-sheath element in a desired sequence; and

(h) sealing means peripherally positioned about the balloon element and approximately between the proximal and distal chambers and which moves with the balloon element between an inflated and a noninflated position to provide for a seal between the inner wall of the uterus and the first proximal chamber in the inflated condition;

whereby, on insertion of the delivery head into the uterine cavity, positioned approximately opposite the uteral fundus, the proximal and distal chambers may be inflated in sequency by the introduction of fluid from the source of fluid, firstly, to effect a seal between the interior wall of the uterus and the expanded balloon sheath, and, thereafter, to permit the introduction of an occluding polymer, and, thereafter, the forcing of the occluding polymer into the fallopian tubes by the full pressurization of the second distal chamber of the balloon-sheath element, and the subsequent deflation of both chambers and the withdrawal of the device from the uterus.

4,160,447

DEVICE FOR DETECTING PARTICULAR POINT OF HUMAN BODY

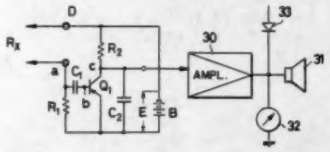
Toru Teshima, Hadano, and Yoshinori Uchiyama, Machido, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 798,002

Claims priority, application Japan, May 20, 1976, 51/64152[U]; May 21, 1976, 51/65176[U]; Jun. 11, 1976, 51/76047[U]

Int. Cl.[2] A61B *5/05*; A61H *39/02*

U.S. Cl. 128—735 **6 Claims**



1. A device for detecting a particular point of a human body comprising:

a searching probe adapted to selectively contact different points of a human body for detecting an impedance value of skin resistance as a function of electric current flowing through the human body;

a source of power (B);

means (D) for stationarily connecting a first pole of said power source to the skin of the human body;

a first resistor (R_1) connecting a second pole of said power source to said probe;

a first capacitor (C_1), one terminal of which is coupled between said first resistor (R_1) and said probe;

a transistor (Q_1) having a base connected to the other terminal of said first capacitor; an emitter coupled to said second pole of said power source and a collector;

a second resistor (R_2) coupling said collector to said first pole of said power source;

a second capacitor (C_2) coupled between said collector and emitter of said transistor; and

indicating means coupled to said collector of said transistor, said indicating means including at least a luminous diode for indicating a change in impedance detected by said searching probe;

said transistor, first and second resistors and first and second capacitors comprising a time limit circuit for permitting substantially immediate actuation of said indicating means only one time immediately responsive to an impedance change detecting signal from said searching probe, said time limit circuit cutting off the supply of electrical current from said power source to said searching probe a predetermined period of time after generation of said detecting signal.

4,160,448

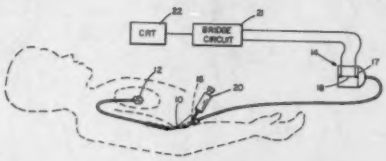
BLOOD PRESSURE MEASURING CATHETER

Richard R. Jackson, Eight Trinity Rd., Marblehead, Mass. 01947

Filed May 23, 1977, Ser. No. 799,432

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—673 **6 Claims**



1. A catheter sized for insertion through a needle-like probe into a blood vessel for the purpose of determining blood pressure, the portion of said catheter insertable through said needle-like probe having a liquid-impermeable, flaccid wall positioned to enter directly into the bloodstream and a cannula communicating from the exterior side of said flaccid wall to a blood pressure-responsive indicator, means for admitting liquid to said cannula to establish a static isolated liquid volume from the flaccid wall to said indicator, said flaccid wall arranged to deflect while in said bloodstream in direct response to the pressure of the blood in the manner to transmit said blood pressure directly to the said isolated static liquid within said cannula and said cannula adapted to transmit the pressure of said isolated liquid out of said blood vessel to said pressure-responsive indicator whereby blood pressure can be determined directly.

4,160,449

EARPLUG

Kenneth L. Wade, Box 22, Croton-on-Hudson, N.Y. 10520

Filed Sep. 28, 1977, Ser. No. 837,530

Int. Cl.[2] A61F *11/02*

U.S. Cl. 128—152 **9 Claims**

1. An earplug comprising a generally cylindrical plug of soft compressible resilient spongy material, said plug having a diameter in relaxed condition slightly greater than the average diameter of the outer canal of a human ear, and a tubular

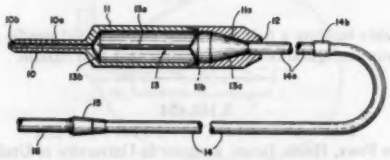
envelope of thin flexible plastic material which is closed at its inner end and receives said plug snugly but not tightly, said envelope having an outer end portion that extends beyond the outer end of said plug, means at least partially closing said extending portion of said envelope at a distance from the outer end of said plug to retain said plug in said envelope, said extending portion of said envelope being twistable to compress said plug and thereby reduce its diameter to facilitate introduction of said plug into the outer ear canal, whereupon said envelope is released to permit said plug to expand to conform to the outer ear canal.

4,160,450

OUTSIDE-THE-NEEDLE CATHETER DEVICE WITH NEEDLE HOUSING

George O. Doherty, 2301 River Rd., Missoula, Mont. 59801

Filed Jul. 15, 1977, Ser. No. 815,806
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214.4 10 Claims



1. A catheter device, comprising a catheter having a free end for insertion in a venipuncture; a housing connected liquid-tight at one of its ends to an end of the catheter for liquid flow therebetween, said housing being adapted to define an elongate, liquid flow chamber internally thereof and being itself liquid-tight except for an opening through its end opposite the catheter; a hollow, stylet needle having a sharp end adapted to extend beyond the free end of the catheter to effect venipuncture, and a shank adapted to extend through the catheter internally thereof and into the said flow chamber of the housing during venipuncture, the length of the portion of the needle disposed within the catheter and extending beyond the free end thereof during venipuncture being less than the maximum length of said liquid flow chamber of the housing, so extended movement of the needle relative to the housing or vice versa following venipuncture will protectively position the sharp end of the needle within said housing and liquid supplied through the hollow interior of the needle will flow into said chamber and thence into and through said catheter; a tube for the supply of a venoclysis liquid extending through and substantially closing said opening and connected liquid-tight to the needle; and means by which said opening is closed liquid-tight.

4,160,451

UNIDIRECTIONAL CATHETER PLACEMENT UNIT

Richard M. Chittenden, Grayslake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 25, 1977, Ser. No. 854,858
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214.4 10 Claims

1. In a catheter placement unit comprising:

an enclosed container having a base portion including an outlet from said container and an upper portion including a reel for a catheter, said upper portion rotatably mounted on said base portion;

a hollow needle having a pointed distal end and a proximal end secured to said container in communication with said outlet therefrom; and

a catheter wound on said reel of said container and extending through said outlet into said hollow needle so that rotating said upper portion relative to said base portion advances or retracts said catheter out of or into said needle; the improvement which comprises the addition to said catheter placement unit of:

a clutch cooperable with said upper portion to allow said upper portion to be manually rotated only in the direction that advances said catheter,

said clutch including a rotatably mounted cover overlying and concealing said upper portion and means for coupling said cover to said upper portion only when said cover is rotated in the direction predetermined to rotate said upper portion in the direction that advances said catheter.

4,160,452

OSMOTIC SYSTEM HAVING LAMINATED WALL COMPRISING SEMIPERMEABLE LAMINA AND MICROPOROUS LAMINA

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Apr. 7, 1977, Ser. No. 785,582
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 14 Claims

1. An osmotic therapeutic system for the controlled dispensing of a beneficial drug formulation to a biological fluid environment of use comprising:

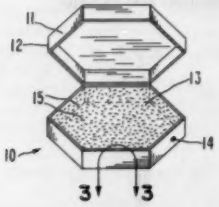
(a) a shaped laminated wall comprising: a semipermeable lamina that is formed of a material permeable to the passage of an external fluid, substantially impermeable to the passage of drug, and essentially maintains its physical and chemical integrity in the biological environment of use, said semipermeable lamina in laminar arrangement with a lamina formed of a material that forms in the environment of use a microporous lamina having a plurality of micropores with paths through the lamina, said laminated wall surrounding and forming:

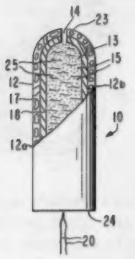
(b) a compartment containing a beneficial drug formulation;

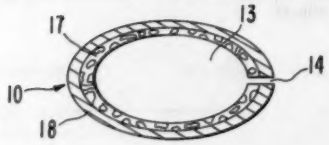
(c) a passageway in the laminated wall communicating with the compartment and the exterior of the system for dispensing drug formulation from the system; and,

(d) wherein in operation, when the system is in the environment of use, fluid from the environment is imbibed through the laminated wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the laminated wall and the

osmotic pressure gradient across the laminated wall, thereby forming a solution containing the drug formulation that is dispensed through the passageway at a controlled rate over a prolonged period of time.







4,160,453

APPARATUS FOR IMPLANTING HAIR

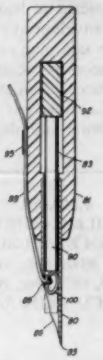
Paul W. Miller, Atlanta, Ga., assignor to Hairegenics, Inc., Atlanta, Ga.

Division of Ser. No. 637,843, Dec. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 516,887, Oct. 22, 1974, Pat. No. 3,998,230. This application Sep. 6, 1977, Ser. No. 830,449

Int. Cl.[2] A61B *17/00, 17/34*

U.S. Cl. 128—330 **2 Claims**

1. Apparatus for implanting hair having a bulbous end into human skin comprising a tubular needle having a beveled cylindrical end providing a pointed tip for penetrating the skin and a notch formed in said tubular needle beveled end through which the hair may extend with the bulbous hair end held within the tubular needle in engagement with an inner surface of the needle adjacent the beveled end notch; a cylindrical push rod slidably disposed within said tubular needle; a first handle to which said hollow needle is secured; a second handle mounted in mutual sliding engagement with said first handle to which second handle said push rod is secured; and means for releasably holding a hair extending through said needle notch in a taut configuration firmly against said first handle.



4,160,454

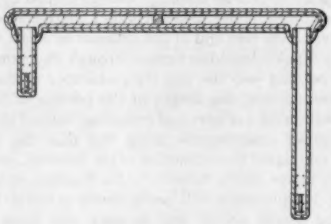
IMPLANTABLE CATHETER SYSTEM

Amnon Foux, Haifa, Israel, assignor to University of Utah, Salt Lake City, Utah

Continuation of Ser. No. 594,374, Jul. 9, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,520

Int. Cl.[2] A61M *25/00, 05/00*

U.S. Cl. 128—348 **10 Claims**



1. An implantable catheter comprising

an elongate hollow member adapted for subcutaneous placement in a person, said member being constructed of a material which is penetrable by a needle, the hollow of the member being divided into two portions neither of which is in communication with the other, said hollow member including wire coil reinforcing structure extending about the hollow of said hollow member to prevent collapse of the member when fluid is withdrawn therefrom,

a first tubular member extending from near one end of said hollow member to enable communication between the tubular member and one of said hollow portions, and

a second tubular member extending from near the other end of said hollow member to enable communication between the second tubular member and the other of said hollow portions, said second tubular member being spaced apart from and having a different length than said first tubular member,

each of said tubular members having at least one opening therein to enable the flow of fluid between the interior and the exterior of said tubular members, the tubular members further including protuberances on the exterior surface thereof to project above the openings, and

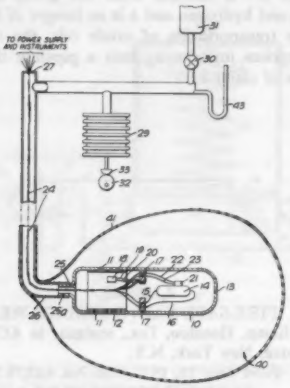
the exterior surface of said hollow member being adapted to accommodate human tissue growth thereon.

4,160,455

HEATER FOR HEATING FLUID IN A BODY CAVITY

James T. Law, Edinburgh, Scotland, assignor to Ferranti Limited, Hollinwood, England

Filed Jul. 13, 1977, Ser. No. 815,282
Claims priority, application United Kingdom, Jul. 14, 1976, 29194/76
Int. Cl.[2] A61F 7/00
U.S. Cl. 128—400 17 Claims



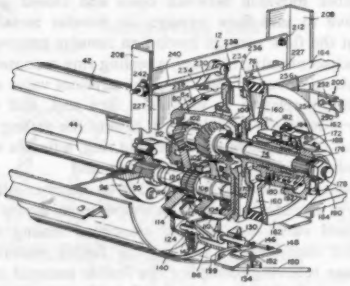
1. A heater for heating fluid within a body cavity of an animal including a container adapted to be inserted into the body cavity and having inlet and outlet ports, pumping means for causing fluid to be drawn from the cavity into the container through the inlet port and expelled into the cavity through the outlet port, and a heating element located within the container between the inlet and outlet ports so that at least some of the fluid passing through the container will be heated by said element.

4,160,456

2-SPEED ROTOR GEAR CASE

Robert W. Hawkins, Rapids City; Paul G. Togami, East Moline, and T. Gary Drayer, Silvis, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Sep. 16, 1977, Ser. No. 833,775
Int. Cl.[2] A01F 12/56
U.S. Cl. 130—27 T 14 Claims



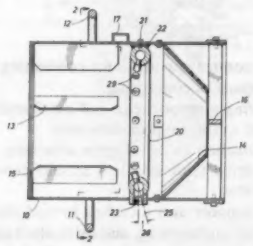
1. In a self-propelled axial flow combine having a mobile chassis mounted on wheels, a threshing concave provided with a cooperating rotor including a rotor shaft which extends in the longitudinal direction of the combine, and an engine including an engine drive shaft, the combination therewith of improved transmission means drivingly connecting said drive shaft to said rotor shaft, said transmission means comprising a first V-belt sheave mounted on said chassis for rotation about a fixed axis, said first sheave is effectively a fixed sheave, means operatively connecting the drive shaft to said first sheave in driving relationship, a gear case housing having a forwardly projecting output shaft and a rearwardly projecting input shaft, said output and input shafts being disposed in spaced apart parallelism, means operatively connecting said output shaft to the rotor shaft in driving relationship, speed change gearing connecting said input shaft and output shaft, a second V-belt sheave mounted on said input shaft for rotation in unison therewith, a V-belt trained around said first and second sheaves, the second sheave is a variable diameter sheave and includes a pair of sheave sections capable of relative axial shifting movement toward and away from each other, and a compression spring yieldingly urges said sheave sections toward each other in V-belt-engaging relationship, said housing being capable of limited tilting movement about the axis of said output shaft in order to shift said input shaft and sheave carried thereby toward and away from said first sheave for belt tension regulating purposes, releasable means for securing said housing in selected positions of inclination, said engine being disposed rearwardly of the gear case housing, and wherein the means for operatively connecting the engine drive shaft to said first sheave includes a jackshaft on which such first sheave is mounted, and a belt, pulley and idler arrangement effectively extends between said engine drive shaft and the jackshaft.

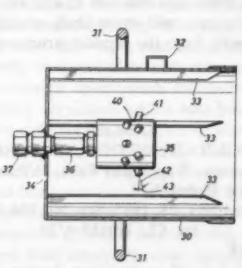
4,160,457

TOOL JOINT CLEANER

Leon L. Dickson, Jr., and Early B. Denison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1977, Ser. No. 846,750
Int. Cl.[2] B08B 3/02, 9/02
U.S. Cl. 134—167 C 3 Claims





1. A hand-held cleaner for cleaning the pin ends of a tubular member using a source of high-pressure liquid as the cleaning medium, said cleaner comprising:

a tubular housing, said housing having at least one open end for receiving said tubular member;

handle means secured to the exterior of said housing for use by an operator;

a circular tubular manifold, said manifold being mounted in

the interior of said tubular housing with the plane of the manifold being substantially at right angles to the axis of said housing;

a plurality of jet nozzles mounted on said manifold with their discharge openings pointed inwardly, the axis of said nozzles being disposed at an angle of 15 degrees to radii of said housing to create a swirling flow pattern and at an angle of 15 degrees to the plane of the manifold;

means for coupling the source of high-pressure liquid to said manifold; and,

control means mounted on said handles for operation by said operator, said control means being disposed to control the flow of the high-pressure liquid.

4,160,458

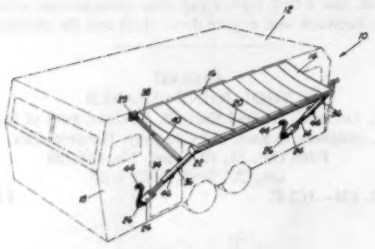
AWNING CONTROL APPARATUS

Donald O. Marcellus, 1505 E. Grand, Haysville, Kans. 67060

Filed Dec. 9, 1977, Ser. No. 859,025

Int. Cl.[2] E04F *10/06*

U.S. Cl. 135—5 AT **13 Claims**



1. An awning control apparatus for connecting to a support structure, the apparatus comprising:

an awning having a support end and a roll end, the support end attached to the support structure;

drive means attached to the support structure;

an elongated drive shaft attached to said drive means and rotated thereby;

a telescoping support arm attached to said drive shaft and the roll end of said awning, said drive shaft extending said support arm and said awning outwardly from the support structure; and

a telescoping brace arm attached to said drive shaft and the support structure, said drive shaft extending said brace arm outwardly from the support structure.

4,160,459

LOW POUR CRUDE OIL COMPOSITIONS

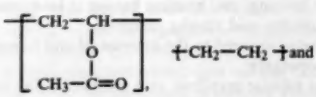
William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,305

Int. Cl.[2] H01M *4/20*

U.S. Cl. 137—13 **6 Claims**

1. A residual fuel oil composition having improved pour point characteristics comprising a waxy crude oil and an effective pour depressant amount of an oil-soluble terpolymer comprising recurring units of:



and

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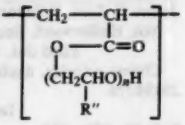


wherein R″ is selected from the group consisting of $-CH_3$ and hydrogen and n is an integer of from 1 to 5.

6. In the transportation of crude oils, the improvement which comprises introducing into a pipeline the crude oil composition of claim 1.

4,160,460

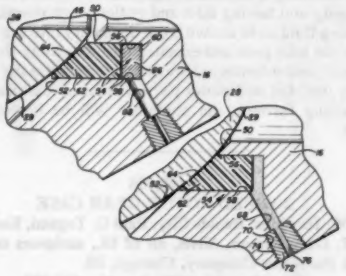
FIRE-SAFE VALVE STRUCTURE

Willard E. Kemp, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 11, 1977, Ser. No. 823,787

Int. Cl.[2] F16K *5/06*

U.S. Cl. 137—72 **16 Claims**



1. A fire-safe valve structure comprising:

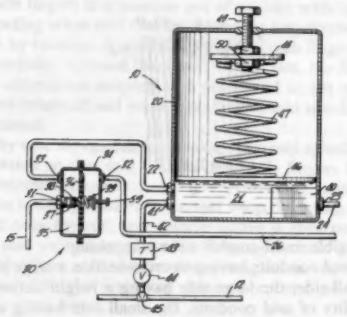
a valve body having a flow passage therethrough and a valve chamber, a valve member mounted within the valve chamber movable between open and closed positions relative to said flow passage, an annular metallic seat about the flow passage having an annular groove facing the adjacent valve member, a sealing ring mounted in the annular groove for contacting the adjacent valve member in sealing relation to provide a face seal, said annular groove having a space therein behind the sealing ring to permit displacement of the sealing ring, a fusible material chamber associated with said space; and

a fusible material in said fusible material chamber adapted to melt at a predetermined high temperature, means mounting said valve member and associated sealing ring for limited displacement toward the fusible material, and passage relieving means for the fusible material chamber to permit the fusible material to flow therein after melting, said fusible material upon reaching a predetermined high temperature melting and flowing from the material chamber to permit displacement of the sealing ring and valve member whereby said valve member contacts the adjacent metallic seat to provide a tight metal-to-metal seal between the valve member and the seat upon reaching said predetermined high temperature.

4,160,461
WATER AND ENERGY CONSERVATION SYSTEM

Marcel Vataru, 523 Kings Rd., Los Angeles, Calif. 90048; Leo Miller, 1062 Maybrook Dr., Beverly Hills, Calif. 90210, and Dennis W. Schwesinger, 22708 Roda St., Canoga Park, Calif. 91304

Filed Feb. 21, 1978, Ser. No. 879,475
Int. Cl.[2] E03C 1/02
U.S. Cl. 137—337 15 Claims



1. A water conservation system connectable between a hot water line and a hot water faucet comprising:

a reservoir having an inlet and an outlet;

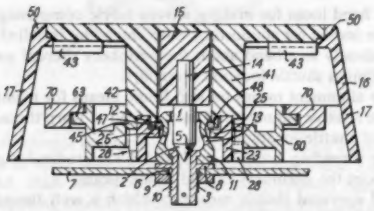
first control means connectable to said hot water line, said faucet, and said reservoir inlet for permitting the flow of water from said line into said reservoir when said faucet is open and for preventing the flow of water from said line into said reservoir when said faucet is closed; and

second control means connectable between said reservoir outlet and said faucet for permitting the flow of water from said reservoir to said faucet when said water in said reservoir is at or above a predetermined temperature and for preventing the flow of water from said reservoir to said faucet when said water in said reservoir is below said predetermined temperature.

4,160,462
ADJUSTABLE RELIEF VALVES AND PRESSURE COOKERS INCORPORATING SUCH VALVES

Alan G. Rossi-Ashton, Oxted, England, assignor to The Prestige Group Limited, London, England

Filed Jul. 12, 1977, Ser. No. 814,978
Claims priority, application United Kingdom, Jul. 19, 1976, 30040/76
Int. Cl.[2] F16K 15/00
U.S. Cl. 137—529 17 Claims

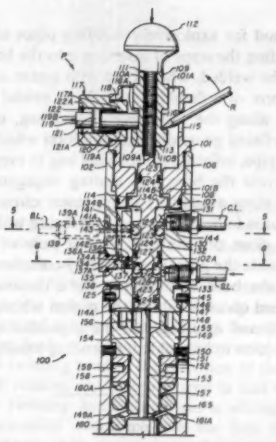


1. An adjustable relief valve comprising a valve member and a valve seating member, said valve member and valve seating member being operative under the weight of one of said members to close a valve port of said valve seating under a predetermined force, a weight adapted to be removably secured to one of said members to increase the relative closing force of said members beyond said predetermined force, said removable weight being of an annular configuration, bayonet connection means between said removable weight and one of said members for removably securing the same to each other, said bayonet connection means including at least two L-shaped slots carried by one of said members and weight removably interlockable with at least two pins carried by the other of said one member and weight, and each L-shaped slot having an entrance portion and a re-entrant portion remote therefrom whereby said pins are introduced into said slots through said entrance portions and seat within said re-entrant portions to retain said weight and one member in secured relationship.

4,160,463
FLOW LINE MONITOR PILOT VALVE ASSEMBLY

Neil H. Akkerman; Stephen R. Foster, and Kip B. Goans, all of New Orleans, La., assignors to Baker CAC, Inc., Belle Chasse, La.

Filed Oct. 13, 1977, Ser. No. 841,940
Int. Cl.[2] F16K 11/16, 31/122
U.S. Cl. 137—596.18 21 Claims



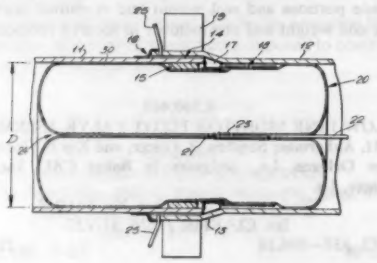
13. A control fluid valve assembly for controlling flow of a first fluid source and respondable to a pressure monitored fluid, comprising: a housing; valve means within said housing having valve seat means thereon; free travelable spherical means immediate said valve means defining valve head means and sealingly engagable onto said valve seat means and wipable thereoff to selectively open and close said valve means to control fluid flow therethrough; spool means shuttleable in at least one of linear and rotary directions within said housing immediate said valve means and operably associatable with said valve seat means and said valve head means to permit selective movement of said head means to said seat means and selective engagement of said head and seat means upon only one of linear and rotational shuttling of said spool means; and a plurality of seal means, securable between said housing and said spool means to prevent fluid communication therebetween and defining flow passageways within said housing and across said spool means, said spool means being shiftable in each of first and second directions whereby subsequent to shifting in one of said first and second directions pressure is substantially equalized through said flow passageways by said seal means and said spool means is statically stabilized by one of said seal means, within said housing and whereby when said spool means is shifted in the other of said first and second directions differential pressure is thereafter defined across one of said seal means to urge and hold said spool means in said other direction.

4,160,464

SEALING MEMBERS

Hugh A. Ballinger, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 5, 1974, Ser. No. 529,726
Claims priority, application United Kingdom, Dec. 6, 1973, 56692/73
Int. Cl.[2] F16L *55/12*
U.S. Cl. 138—93 7 Claims



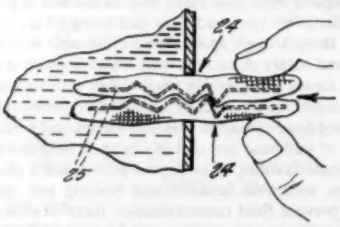
1. A method for explosively welding pipes together under water, including the steps of inserting into the bore formed by the pipes to be welded, when filled with water, a sealing member in the form of a flexible, inflatable toroidal bag having a central hole along the axis thereof, said bag, upon insertion being in a deflated generally flat condition which floats in the water in the pipe, inflating the toroidal bag to expand it radially outwards across the bore into sealing engagement with the bore of the pipes around its entire outer circumference and radially inwards to bring the inwardly facing walls of the torus together to close off the said central hole of the torus to thereby obturate the pipes concurrently completely displacing water from the bore of the pipes for a distance sufficiently great to extend on each side of the region where the pipes are to be welded and assuring that the expanded bag is located adjacent the joint to be welded, extending axially on each side thereof.

4,160,465

EMERGENCY WATER LEAK PLUG

Charles J. Hsu, Box 460, Grand Central Station, New York, N.Y. 10017

Filed Apr. 19, 1977, Ser. No. 788,784
Int. Cl.[2] F16L *55/18*
U.S. Cl. 138—97 1 Claim



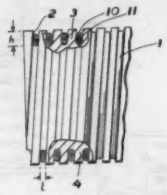
1. An emergency water leak plug, comprising in combination, an elongated bag of porous fabric, said bag being partly filled with a powder of Sterculia Lychnophora Hance which has the characteristic of substantially swelling up in water, said bag additionally including an elongated stiffener member therewithin, said stiffener member comprising a spiral shaped stiff wire, said bag being polygonic in shape, and said spiral shaped stiff wire member having spiral turns progressively spread apart toward one end.

4,160,466

FLEXIBLE MULTI-CONDUIT TUBE AND ITS MANUFACTURE

Pierre J. Jousson, Geneva, Switzerland, assignor to Les Produits Associates LPA SA, Geneva, Switzerland

Filed Dec. 29, 1976, Ser. No. 755,216
Claims priority, application Switzerland, Feb. 24, 1976, 2242/76
Int. Cl.[2] F16L *11/04*
U.S. Cl. 138—115 6 Claims



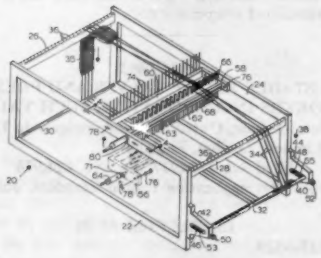
1. A flexible multi-conduit tube comprising:
juxtaposed conduits having in cross-section a large side and a small side, the large side having a height defined by a plurality of said conduits, the small side having a width defined by a number of conduits which is less than the plurality of conduits defining said large side; and
the conduits having a helical configuration in which the tube is wound on its small side, the height of the large side being measurable along the direction of the diameter of the helix.

4,160,467

HAND LOOM HAVING ROTARY HEDDLE ASSEMBLY

Jed R. Woodruff, 3042 N. 175 W., North Ogden, Utah 84404

Filed Jan. 5, 1978, Ser. No. 867,196
Int. Cl.[2] D03D *29/00*; D03C *13/00*
U.S. Cl. 139—33 22 Claims



1. A hand loom for making woven fabric comprising:
frame means for supporting warp threading installed longitudinally as a band about the periphery thereof and providing a shuttle location thereon;
warp alignment means on said frame means for maintaining the relative alignment of each thread of warp threading at said shuttle location;
warp threading installed as a band in longitudinal alignment about the periphery of said frame means;
hand operated shuttle means to which a weft thread is attached for movement transversely through predetermined ones of said warp threading at said shuttle location;
transverse demountable heddle spindle means rotatably mounted in an operating position at the periphery of said frame means adjacent to said shuttle location generally perpendicular to said warp threading, and removable from said frame means to facilitate installation of said warp threading;

a first set of slideably positionable heddle fingers retained in a first locking slot in said spindle means lying in a plane in axial alignment along said heddle spindle means, each finger extending radially outward from said first slot, said fingers adapted and positioned to lift predetermined ones of said warp threading;

at least a second set of slideably positionable heddle fingers retained in a second locking slot in said spindle means lying in a plane in axial alignment along said heddle spindle means and radially displaced from said first set of heddle fingers to a position out of contact with said warp threading when said first set is brought into contact therewith by rotation of said spindle means, each finger extending radially outward from said second slot, the fingers of said second set adapted and positioned to lift predetermined others of said warp threading as said spindle means is rotated;

whereby said woven fabric is made when said spindle means is rotated so that said first set of heddle fingers lifts said predetermined ones of said warp threading, said shuttle means is then passed between said warp threading and said lifted ones thereof, said spindle means is then rotated so that said second set of heddle fingers lifts said predetermined others, said shuttle means is again moved therebetween, with the foregoing process repeated to provide said woven fabric.

4,160,468

WEFT SELECTOR MECHANISM

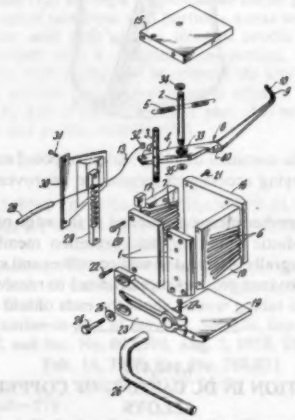
Anselmo B. Camprubi, Barcelona, Spain, assignor to Incotex S.A., Sabadell, Spain

Continuation-in-part of Ser. No. 746,204, Dec. 1, 1976, abandoned, which is a continuation of Ser. No. 621,367, Oct. 8, 1975, abandoned. This application Mar. 17, 1978, Ser. No. 887,842

Claims priority, application Spain, Oct. 11, 1974, 206.559

Int. Cl.[2] D03D *47/38*

U.S. Cl. 139—453 **4 Claims**



1. A weft selector mechanism for looms comprising a casing, a plurality of weft selector levers each having a first and a second end, shaft means within said casing, swivel bearing means comprising flexible bushings mounting each of said weft selector levers on said shaft means at points intermediate said ends of each lever for swiveling pivotal motion about said shaft means, means defining slots in said casing, said slots extending in a direction obliquely to said shaft means and having said weft selector levers guidingly engaged therein to effect movement of said first ends of said weft selector levers through a common point when said levers are pivoted about said shaft means, and drive means engaging said levers at said second ends to selectively effect pivoting thereof about said shaft means.

4,160,469

TWISTING DEVICE FOR A MACHINE FOR BINDING PACKAGES WITH WIRE

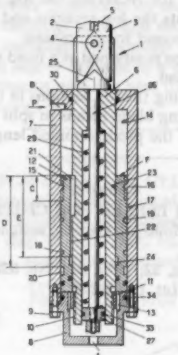
Jean V. Joannic, Paris, France, assignor to Botalam, Paris, France

Filed Jan. 19, 1978, Ser. No. 870,816

Claims priority, application France, Feb. 25, 1977, 77 05576

Int. Cl.[2] B21F *15/04*

U.S. Cl. 140—115 **2 Claims**



1. A twisting device for a machine for binding packages with wire, the device having a twisting head in the form of nippers with means for rotating them and causing their opening and closing about the ends of the binding wire, the twisting head being integral with a first piston-like member mounted to be movable in translation in a fixed cylindrical body and having a threaded part engaged with a corresponding thread provided in said cylindrical body to cause a progressive translational movement of the twisting head in the direction of the package to be tied up as it rotates, and characterized in that the means for rotating the twisting head comprises a second annular piston slidably mounted and keyed on the first piston-like member and engaging at its periphery with the inner wall of the fixed cylindrical body by means of a large pitch screw thread, the annular piston being actuated by the pressure of a fluid.

4,160,470

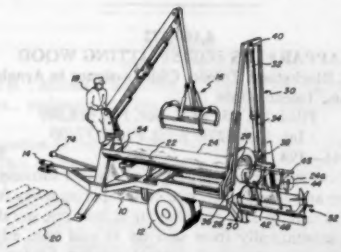
LOG SHEARING AND SPLITTING DEVICE

Richard W. Sigmund, Medford, Wis., assignor to Timbern, Ltd., Medford, Wis.

Filed Mar. 13, 1978, Ser. No. 885,612

Int. Cl.[2] A47J *42/09*; B27L *7/00*

U.S. Cl. 144—3 B **17 Claims**



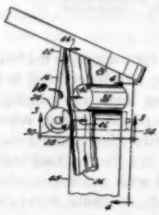
1. A firewood making machine comprising:

first substantially horizontal trough means for receiving logs;
clamshell loading means for loading logs into the first trough means;
advancing means for advancing the logs in the first trough means a predetermined length past a cutting location;
cutting means located at the cutting location for cutting log sections of the predetermined length from the logs after the advancing means has advanced the logs;
second substantially horizontal trough means positioned to receive the log sections, the second trough means being positioned essentially parallel to the first trough means and below the cutting means;
log guiding means for receiving the log sections after the cutting means cuts the log sections and lowering the log sections to the second trough means;
splitting blade means positioned at a fixed position along the second trough; and
ram means for driving the log sections in the second trough against the splitting blade means to split the logs into split firewood logs of the predetermined length.

4,160,471
POWER INFEED FOR CHIPPER

Joseph A. Lapointe, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Aug. 22, 1977, Ser. No. 826,411
Int. Cl.[2] B27C *1/12*
U.S. Cl. 144—176 **8 Claims**



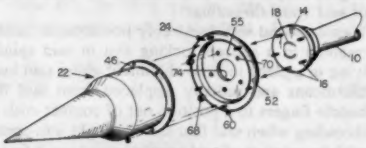
1. An infeed for a chipper comprising an anvil member forming a support having limited surface contact with a log to be chipped, a chipping head cooperating with said anvil a backing member spaced from said anvil member along a feed path of a log to said chipper, a power roll, means to rotate said power roll to advance a log towards said chipper, means mounting said power roll for movement in a path traversing said feed path between said anvil and said backing member, said anvil and said backing member forming a pair of support means spaced along said feed path, said pair of support means providing a pair of adjacently spaced contact points for said log as it is fed to said chipper, means for moving said power roll in said path traversing said feed path, said contact points and said power roll defining means whereby said logs simulates a beam supported by said adjacently spaced contact points against a concentrated load applied therebetween by said power roll as said log is fed to said chipper.

4,160,472
APPARATUS FOR SPLITTING WOOD

George H. Blackstone, Toledo, Ohio, assignor to Arnold Industries, Inc., Toledo, Ohio

Filed Jul. 25, 1977, Ser. No. 818,389
Int. Cl.[2] B27L *7/00*; F16H *37/00*
U.S. Cl. 144—194 **9 Claims**

1. A wood splitter comprising wall means forming a cone having a tip and a base edge, said cone tapering away from said base edge to said tip, said cone having at least one spiral groove extending substantially from said tip to said base edge, wall means forming a truncated conical portion having a small diameter outer edge substantially equal to the diameter of the base edge of said cone and affixed thereto and having a larger diameter inner edge, said truncated conical portion being formed with an included angle which is effective to enable said truncated conical portion to further aid in splitting the wood when coming into contact therewith, wall means forming a

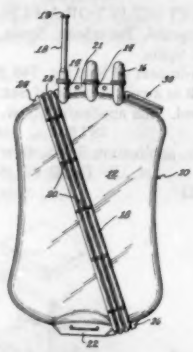


cylindrical base wall having a diameter substantially equal to the larger diameter of said truncated conical portion and affixed thereto, and means for connecting said cylindrical base wall to drive means for rotating said cone.

4,160,473
PLASTIC CONTAINER WITH AUXILIARY TUBE RETENTION MEANS

David A. Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 19, 1978, Ser. No. 907,367
Int. Cl.[2] B65D *1/00*
U.S. Cl. 150—0.5 **14 Claims**



8. In a plastic container defining sealed, opposed ends, one of said ends carrying access port means, the improvement comprising:
retention member means positioned at the edge of each end of said plastic container, said retention member means being integrally attached to said container and comprising open transverse grooves proportioned to receive a length of flexible tubing wound about the ends of said container.

4,160,474
LUBRICATION IN DC CASTING OF COPPER BASE ALLOYS

Michael J. Pryor, Woodbridge, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

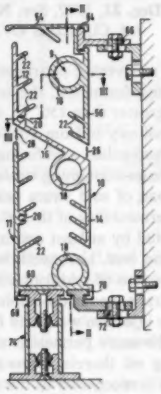
Filed Dec. 20, 1977, Ser. No. 862,371
Int. Cl.[2] B22D *11/00*
U.S. Cl. 164—73 **27 Claims**

1. A composition which is particularly useful as a mold dressing material in the direct chill casting of copper base alloys, said composition consisting essentially of a dispersion of a combination of 50 to 99% by volume boron nitride particles, balance carbonaceous particles, in a volatile liquid carrier, wherein the carrier constitutes from 30 to 80% by volume of the dispersion.

4,160,475
WARM WATER HEATER

Thomas Wilbs, Wiesenstr. 5, Wutoschingen, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 812,591
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630524
Int. Cl.[2] F24H 9/08
U.S. Cl. 165—55 9 Claims

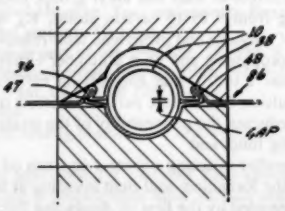


1. A warm water heater apparatus having a front member in a vertical plane; rear walls; a plurality of vertically spaced horizontal water pipes, said pipes having ends connected with support posts provided with water channels, wherein: said front and rear walls each being defined by a plurality of vertically spaced front wall portions (12) and vertically spaced rear wall portions (14), said rear wall portions (14) having a horizontal air inlet gap (26) formed therebetween and said front wall portions (12) having a horizontal air outlet gap (28) therebetween; one of said front wall portions, a rear wall portion, an intermediate wall (16) and an integral profile element (10) being provided with a constant cross-section, whereby said intermediate wall is disposed to connect the lower edge of the front wall portion (12) with the upper edge of the rear wall portion (14); and at least one water pipe (18) being integrally formed in said profile element (10).

4,160,476
SECUREMENT OF HEAT EXCHANGER SURFACES TO TUBES BY LOCK SEAMING AND METHOD OF FABRICATION

Larry J. Ashton, Thousand Oaks, and Leo Block, Westlake Village, both of Calif., assignors to Raypak, Inc., Westlake Village, Calif.

Continuation-in-part of Ser. No. 506,226, Sep. 16, 1974, abandoned, and Ser. No. 602,592, Aug. 7, 1975. This application Feb. 14, 1977, Ser. No. 768,071
Int. Cl.[2] B23P 15/26
U.S. Cl. 165—171 18 Claims



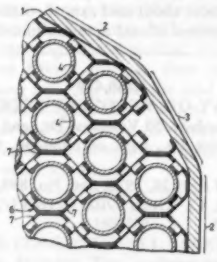
1. A securement between first and second pieces of material comprising in combination, a lock seam formed between portions of the first and of the second pieces of material, the lock seam being formed by a portion of one piece of material and by an intermediate portion of the second piece of material remote from edges thereof, said pieces of material being formed, adjacent said seam, to extend around a heat exchange tube whereby said second piece of material defines a continuous flow path for heat to said tube.

6. A method of forming a joint between first and second sections of sheet material including forming a lock seam between an edge portion of a first piece of material and an intermediate portion of the second piece of material, forming the first and second pieces of material on one side of said seam to fit around a heat exchange tube, and securing the material to the tube in heat exchange relationship by forming the lock seam adjacent one side of the tube as a heat exchange surface to provide a continuous path for heat transfer along said second piece and through said seam.

4,160,477
SPACER GRID FOR PARALLEL CYLINDRICAL TUBES

Josua Roffler, Raterschen, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Aug. 29, 1977, Ser. No. 828,423
Claims priority, application Switzerland, Sep. 6, 1976, 11279/76
Int. Cl.[2] F28F 9/00
U.S. Cl. 165—172 9 Claims



1. In combination,

a plurality of parallel heat exchanger tubes disposed in a regular triangular grid with constant pitch; and

a grid spacing said tubes from each other, said grid comprising a plurality of bent metal strips, each said strip having alternating angular sides and flat sides and being secured to an adjacent strip at alternating flat sides to form a series of hexagonal spaces therebetween with one of said tubes being disposed in each respective one of said spaces, and a pair of adjacent spring tabs bent out of each of said angular sides in alternating manner to project into an adjacent hexagonal space to effect support of a respective tube therein.

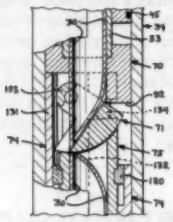
4,160,478
WELL TOOLS

Michael B. Calhoun, Carrollton, and John V. Fredd, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 790,566, Apr. 25, 1977, abandoned. This application May 10, 1978, Ser. No. 904,431
Int. Cl.[2] E21B 29/00
U.S. Cl. 166—55.1 19 Claims

14. A well tool comprising: a tubular body having an axially extending flow passage therethrough; means secured in said tubular body along said flow passage providing a spherical seat surface generated about a center positioned eccentric relative to the longitudinal axis of said flow passage; an operator ele-

ment rotatably secured in said body on an eccentric axis coincident with said center of said spherical seat, said operator element having a spherical surface portion generated about an eccentric center coincident with the center of said spherical seat and having a bore therethrough having an axis spaced from said center of said spherical surface, said operator element being rotatable relative to said seat surface between a first open position at which said bore through said operator element is aligned with said flow passage through said tubular body and



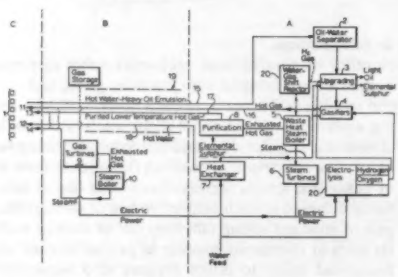
a second closed position at which said bore is misaligned from said flow passage through said tubular body; and an actuator member for rotating said operator element from said first position to said second position, said actuator member having a force applying surface engageable with said operator element along a surface on said operator element spaced from said eccentric axis of rotation of said operator element for rotating said operator element about said axis of rotation responsive to longitudinal movement of said actuator member.

4,160,479

HEAVY OIL RECOVERY PROCESS

Reginald D. Richardson, 53 Valecrest Dr., and Robert H. Shannon, 59 Valecrest Dr., both of Islington, Ontario, Canada M9A 4P5

Filed Apr. 24, 1978, Ser. No. 899,758
Int. Cl.[2] C10G *1/02*; E21B *43/24*
U.S. Cl. 166—267 **18 Claims**



1. A process for the recovery and upgrading of oil containing deposits such as heavy oil, tar sands, shale and coal, which once initiated is essentially energy sufficient, said process comprising the steps of:

(a) recovering the deposit;

(b) treating the deposit to obtain a feedstock;

(c) desulphurizing the feedstock with hydrogen and recovering therefrom a light oil, elemental sulphur and a heavy residual oil;

(d) electrolyzing water to produce hydrogen and oxygen, said hydrogen being utilized in step (c);

(e) gasifying said heavy residual oil in a series of gasifiers using air-oxygen mixtures to produce hot gases, wherein the concentration of air and oxygen may vary from gasifier to gasifier, the oxygen being supplied from step (d); and

(f) utilizing said gasifier hot gases to provide energy for use in the process.

4,160,480

HIGH CONFORMANCE OIL RECOVERY PROCESS

Vernon H. Schievelbein, and Jack H. Park, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,505
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—269 **16 Claims**

1. A method of recovering petroleum from a subterranean, petroleum-containing formation, the temperature of said formation being not greater than 150° F., said formation containing water whose salinity is from 10,000 to 200,000 parts per million total dissolved solids, said formation containing at least two distinct petroleum-containing strata or layers, the permeability of at least one of said strata being at least 50 percent greater than the permeability of the other stratum, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with at least two of said formation strata, comprising

(a) injecting a first aqueous oil-displacing fluid into the formation via the injection well, said fluid passing through at least one of the more permeable strata of said formation and displacing oil therein toward the production well, from which it is recovered to the surface of the earth;

(b) after said first aqueous oil displacing fluid has passed substantially through at least one of said more permeable strata to the production well, discontinuing injecting said fluid and injecting into said stratum an aqueous emulsifying fluid containing an emulsifying surfactant combination comprising (1) from 0.01 to 10.0 percent by weight of an alkylpolyalkoxy sulfate or alkylarylpolyalkoxy sulfate having the following formula:

$$RO(R'O)_nSO_3M$$

wherein R is an alkyl group, linear or branched, having from 9 to 25 carbon atoms, or an alkylaryl group selected from the group consisting of benzene, toluene and xylene having attached thereto at least one alkyl group, linear or branched, having from 9 to 15 carbon atoms; R′ is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher alkylene; n is a number including fractional numbers, from 2 to 10; and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and ammonium, and (2) from about 0.1 to about 5.0 percent by weight of a low HLB, water insoluble nonionic surfactant having the following formula:

$$R_a(OR_a')_{na}OH$$

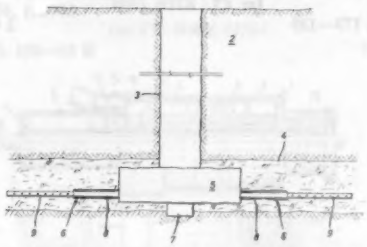
wherein R_a is a branched or linear alkyl group, containing from 9 to 25 carbon atoms, or an alkylaryl group selected from the group consisting of benzene, toluene or xylene having attached thereto at least one alkyl group, linear or branched, containing from 9 to 15 carbon atoms, R_a' is ethylene or a mixture of ethylene and propylene with relatively more ethylene than propylene; and na is a number either whole or fractional, from 1 to 10, said emulsifying surfactants forming a macroemulsion in the more permeable strata of the formation, thereby reducing the permeability of the strata invaded by the emulsifying fluid; and

(c) thereafter injecting a second aqueous oil displacing fluid into the formation; said fluid invading at least one stratum not invaded by the first oil displacing fluid of step (a) and displacing oil therein toward the production well where it is recovered to the surface of the earth.

4,160,481
METHOD FOR RECOVERING SUBSURFACE EARTH SUBSTANCES

L. Jan Turk, and Ralph O. Kehle, both of Austin, Tex., assignors to The HOP Corporation, Houston, Tex.

Filed Feb. 7, 1977, Ser. No. 766,523
Int. Cl.[2] E21B *43/24*; E21C *41/10*
U.S. Cl. 166—272 16 Claims



1. A method of recovering solid and semi-solid petroleum substances and the like from a subsurface earth formation, comprising

establishing at least one substantially vertical shaft hole extending from the surface of the earth to said earth formation,

forming a subterranean operating chamber connecting said shaft hole with said formation,

drilling a plurality of boreholes extending substantially laterally and radially outward from said chamber into said formation,

thereafter injecting steam down said one shaft hole and into said boreholes during a discrete steam injection cycle of predetermined duration to increase the temperature and pressure within the portion of said formation substantially surrounding said chamber and generally defined by the ends of said boreholes, and

thereafter stoppering said boreholes and trapping said steam in said defined portion of said formation during a discrete steam soak cycle of predetermined duration to extend said temperature and pressure increase within said defined portion of said formation and to reduce the viscosity of said petroleum substances lying therewithin.

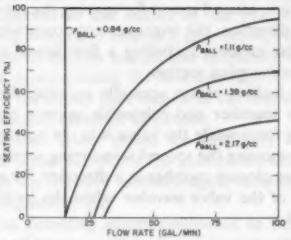
4,160,482
BALL SEALER DIVERSION OF MATRIX RATE TREATMENTS OF A WELL

Steven R. Erbstoesser; Thomas W. Muecke, and Claude E. Cooke, Jr., all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 830,728, Sep. 6, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,649
Int. Cl.[2] E21B *33/13, 43/27*
U.S. Cl. 166—284 17 Claims

1. A method of sealing perforations in a well casing comprising:

injecting into said casing a carrying fluid containing ball sealers having a tentacle-free outer surface and a density less than that of the carrying fluid, said fluid being injected at a matrix flow rate which is less than that which would fracture a formation surrounding said casing and at a velocity which is sufficient to overcome the buoyancy of



said ball sealers and downwardly transport them to the perforations to be sealed.

4,160,483
METHOD OF TREATING A WELL USING FLUOBORIC ACID TO CLEAN A PROPPED FRACTURE

Ronnie L. Thomas, Tulsa, Okla., and Frederick A. Suhy, Mobile, Ala., assignors to The Dow Chemical Company, Midland, Mich.

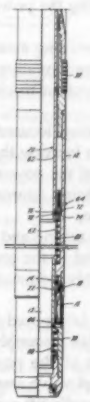
Filed Jul. 21, 1978, Ser. No. 927,000
Int. Cl.[2] E21B *43/27*
U.S. Cl. 166—307 5 Claims

1. A method for increasing the conductivity of a fracture in a subterranean formation penetrated by a borehole wherein at at least some point in time prior to the partial hydrolysis of an effective amount of the fluoboric acid which is injected into the borehole in carrying out the method, the fracture contains a propping agent having siliceous fines or clays dispersed therein, comprising injecting fluoboric acid into the borehole and thereafter permitting the fluoboric acid to at least partially hydrolyze so that at least part of the propping agent pack is contacted with hydrofluoric acid and hydroxyfluoboric acid generated from said fluoboric acid.

4,160,484
SURFACE CONTROL WELL SAFETY VALVE

Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jan. 16, 1978, Ser. No. 869,556
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—317 9 Claims



1. In a well safety valve for controlling the fluid flow through a well tubing, the valve adapted to be positioned in the well tubing and having a valve closure member moving be-

tween open and closed positions, a longitudinally movable tubular member for controlling the movement of the valve closure member, first means for moving the tubular member in a first direction, second means for moving the tubular member in a second direction, the improvement comprising,

said tubular member including a first upper and a second lower telescoping section,

releasable locking means normally securing the telescoping sections together and releasable upon a predetermined opening force while the valve is in the open position, and

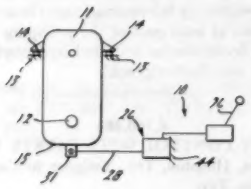
means for moving the second telescoping section relative to the valve closure member in a direction for actuating the closure of the valve member when the locking means is released.

4,160,485

TRACTOR WITH DRAFT LOAD CONTROL SYSTEM

Douglas H. McLean, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1977, Ser. No. 864,076
Int. Cl.[2] A01B *63/112*
U.S. Cl. 172—9 **18 Claims**



1. In a tractor having an engine and transmission power unit coupled to a drive shaft,

resilient mounts mounting the power unit on a frame of the tractor,

the resilient mounts permitting measurable angular displacement of the power unit relative to the frame about the drive shaft axis in reaction to changes in the drive shaft torque,

the resilient mounts being located relatively high on the power unit thereby to increase the degree of lateral movement of the bottom of the power unit,

the lateral movement being approximately proportional to the drive shaft torque,

hydraulic lift means for raising and lowering an earth working implement coupled to the tractor,

a control valve assembly connected to a source of fluid under pressure,

and connecting means interposed between the power unit and the control valve assembly operative to transmit angular displacement of the power unit to an actuating member of the control valve assembly to cause hydraulic actuation of the hydraulic lift means to change the working depth of the implement to compensate for changes in draft load,

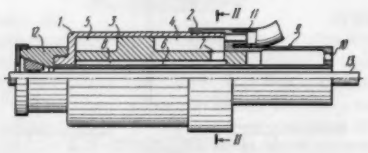
the connecting means being connected to the bottom of the power unit.

4,160,486

PNEUMATIC IMPACT MECHANISM

Alexandr D. Kostylev, ulitsa Derzhavina, 19, kv. 70; Boris N. Smolyanitsky, ulitsa Oleko Dundicha, 27, kv. 18; Vladimir P. Boginsky, ulitsa Lenina, 59, kv. 58; Konstantin S. Gurkov, ulitsa Derzhavina, 18, kv. 13, and Vladimir V. Klimashko, ulitsa Novogodnyaya, 44, kv. 24, all of Novosibirsk, U.S.S.R.

Filed Apr. 22, 1977, Ser. No. 789,864
Claims priority, application U.S.S.R., Apr. 24, 1976, 2356969
Int. Cl.[2] E21B *1/00*
U.S. Cl. 173—135 **2 Claims**

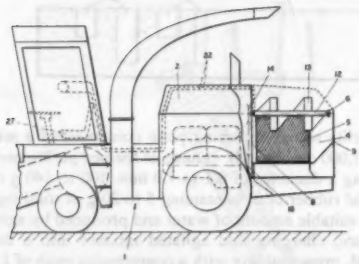


1. A pneumatic impact device for driving rod-like elements axially individually comprising, a tubular guide member for receiving individually rod-like elements axially therein to be driven axially; a tubular casing circumferentially of said tubular guide member secured thereto and coaxial therewith defining a cylinder jointly with said guide member; a clamp for rigidly, releasably securing a leading front end portion of the casing to a rod-like element in said guide member; an elongated tubular hammer piston reciprocably driven in said cylinder to effect working strokes and move cyclically from a rear position toward a forward position to said front end portion of said casing and intermittently impact a front end of said casing; said piston having minor diameter portions and a major diameter portion intermediate opposite minor diameter end portions of the piston defining two coaxial, annular chambers in said cylinder on opposite sides of the major diameter portion and varying in volume as the piston moves reciprocably, one of said chambers being closer to a forward end of the cylinder constituting a front chamber and the other chamber constituting a rear chamber; said piston having a blind axial bore open toward said front end of said casing and communicating with said front chamber when said piston moves away from the front end of the casing toward a rear end of the casing; means for supplying an expandible gaseous fluid under pressure into said rear chamber for reciprocably driving said hammber to intermittently impact the front end of the casing to drive the rod-like element axially; a tubular rear extension on said casing extending axially away from said cylinder and not in communication with said cylinder and into which a rear end portion of said piston extends during axial travel and has reached its rear position; said piston having radial passages on said rear end portion thereof and spaced axially from a rear end of the piston for providing communication between said rear chamber and said blind axial bore when the piston nearly reaches its forward position thereof during a working stroke, said radial passages being disposed in said rear extension when said piston reaches its rear position during said working stroke; said rear extension having an axial length thereof of larger diameter than the remainder thereof disposed at a remote axial position spaced axially from said rear chamber for providing communication between said radial passages and said forward chamber to externally of said casing and thereby to atmospheric pressure when said piston reaches said rear position; whereby application of said gaseous fluid under pressure into said rear chamber moves said piston toward said front end to impact said front end and gaseous fluid enters said front chamber as said piston nears its forward position and returns the piston toward its rear position and said piston is cyclically reciprocated and intermittently impacts said front end for driving a rod-like element axially.

4,160,487
ENGINE COOLING SYSTEM FOR AN AGRICULTURAL VEHICLE

Dieter Kunze, Wehrsdorf; Ernst Leonhardt, Buntzen, and Christian Noack, Guttau, all of German Democratic Rep., assignors to VEB Kombinat Fortschritt Landmaschinen, Neustadt in Sachsen, German Democratic Rep.

Filed Dec. 30, 1977, Ser. No. 865,926
Claims priority, application German Democratic Rep., Dec. 31, 1976, 196733
Int. Cl.² B60K *11/04*
U.S. Cl. 180—68 R 7 Claims

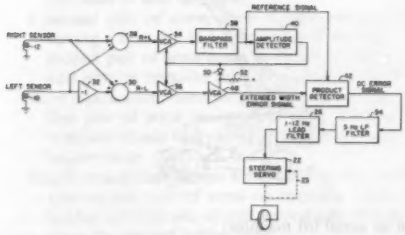


6. In a cooling system comprising an air chamber through which air is induced by a fan and a radiator traversable by a stream of air passing through an opening in said chamber, the improvement which comprises air deflector means in the form of oppositely facing and angularly offset conical shells at least partly arcuately surrounding said fan and coaxial therewith and pivotable thereabout for alternatively guiding air through said chamber in different directions, said fan constituting an axial fan traversing an additional opening in said chamber.

4,160,488
EXTENDED WIDTH SENSOR

Thomas R. Blakeslee, Woodside, Calif., assignor to Logisticon, Inc., Sunnyvale, Calif.

Filed Oct. 11, 1977, Ser. No. 840,643
Int. Cl.² B62D *1/28*
U.S. Cl. 180—168 7 Claims



1. An improvement for extending the control width of an automatic guidance system for steering a vehicle along a guide path, the guidance system being of the type having vehicle mounted left and right sensors for producing left and right error signals, respectively, which are proportional to the distance of the sensors from the guide path and electromechanical steering means supplied with the error signals for steering the vehicle along the guide path in response to the error signals, wherein the improvement comprises

first, second and third amplifiers each having separate signal inputs and outputs and gain control inputs,

means for combining the error signals to produce a sum signal which is supplied to the input of the first amplifier,

means for subtracting one error signal from the other to produce a difference signal which is supplied to the input of the second amplifier, the output of the second amplifier being connected to the input of the third amplifier,

means connected to the output of the first amplifier for generating a negative feedback gain control signal which is supplied to the first and second amplifiers, the negative feedback signal causing the first amplifier to have a gain such that the steady state output of the first amplifier has a susbstantially constant amplitude,

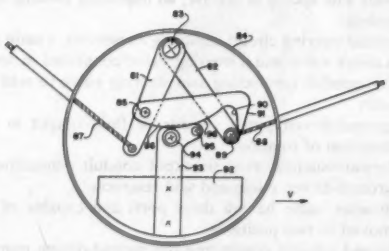
extended sensor width means for supplying the negative feedback signal to control the gain of the third amplifier only after the negative feedback signal exceeds a predetermined magnitude, and

synchronous detecting means connected to the outputs of the first and third amplifiers for producing a direct current electromechanical steering means control signal whose magnitude represents the distance of the vehicle from the guide path and whose polarity indicates on which side of the guide path the vehicle is positioned.

4,160,489
THROTTLE CONTROL DEVICE

Albert Van Dillen, Kroonprins 21, Haaksbergen, Netherlands

Filed Sep. 26, 1977, Ser. No. 836,798
Int. Cl.² B60K *31/00*
U.S. Cl. 180—282 15 Claims



1. A device for restraining the throttle plate of a vehicle engine from returning to closed condition whereby to maintain a predetermined throttle setting, which comprises in combination:

a holding member adapted to be connected to the throttle control of a vehicle engine so as to be movable back and forth along a predetermined path in response to opening and closing movements of such throttle plate;

a locking member mounted for movement along said path and means for selectively fixing said locking member along said path whereby to establish said predetermined throttle setting;

latching means on said locking member for engaging said holding member to prevent return movement of said holding member when said holding member reaches a certain position along said path as established by the fixed position of said locking member; and

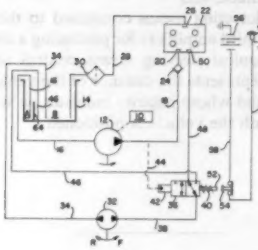
inertia means responsive to deceleration force acting on the associated vehicle for disengaging said latching means from said holding member to allow return movement of said holding member.

4,160,490

AUXILIARY STEERING SYSTEM

Eugen Bexten, Ancaster; Robert W. Logue, Hamilton, and Ken J. Wiebe, Dundas, all of Canada, assignors to International Harvester Company, Chicago, Ill.

Filed Jun. 9, 1977, Ser. No. 804,973
Int. Cl.[2] B62D 5/08
U.S. Cl. 180—133 2 Claims



1. In a log-skidder machine having front and rear frame portions hinged together about a vertical axis for articulated steering, a dozer blade mounted on the front frame and capable of being raised and lowered, and a transmission with gear ratios which permit relatively high speeds in forward and relatively low speeds in reverse; an improved steering system comprising:

a normal steering circuit including a reservoir, a main pump, a check valve and a steering valve connected in series;

a first conduit connecting said steering valve to said reservoir;

a ground-driven pump capable of fluid output in either direction of rotation;

a forward-suction, reverse-output conduit connecting said ground-driven pump and said reservoir;

a diverter valve having three ports and capable of being moved to two positions;

a second conduit connecting the ground-driven pump and diverter valve;

a third conduit connecting the diverter valve and the reservoir;

a fourth conduit connecting the diverter valve and the steering valve;

bias means urging the diverter valve to one of its two positions wherein the second and fourth conduits are in communication and the third conduit is blocked;

actuator means responsive to fluid pressure output from said main pump to shift the diverter valve to the other of its two positions wherein the second and third conduits are in communication and the fourth conduit is blocked;

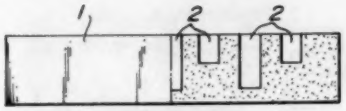
whereby said actuator means normally holds said diverter valve in its said other position and said second, third and forward-suction, reverse-output conduits form a closed path between said ground-driven pump and reservoir for travel in both forward and reverse directions; and loss of pressure to said actuator means permits said bias means to shift said diverter valve to its said one position so that travel in a forward direction will permit the ground-driven pump to supply fluid pressure to said steering valve and travel in a reverse direction can be controlled by lowering said blade to the ground.

4,160,491

PERLITE SOUND ABSORBING PLATE AND SOUND INSULATING WALL COMPOSED OF THE SAME

Masayasu Matsumoto, Zushi; Susumu Sakamoto, Yokohama; Nobufumi Matsudaira, Zushi; Kazuyoshi Iida, Yokohama; Yoshikazu Kondo, Tokyo; Kazuo Kondo, Yokohama; Haruo Watanabe, Chigasaki; Shosuke Suzuki, Zushi, and Yasushi Onizaki, Yokohama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 928,030
Int. Cl.[2] E04B 1/82; C04B 43/00
U.S. Cl. 181—284 7 Claims



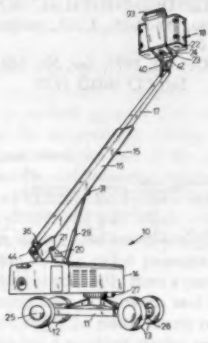
1. A perlite sound absorbing plate composed of a mixture including 1,000 cm^3 by bulk volume of foamed perlite particles each having a diameter of 0.1 to 7.0 mm, 100 to 140 g of cement, liquid rubber latex containing 5 to 20 g of solid ingredients and a suitable amount of water and produced by agitating said mixture, charging said agitated mixture into a desired metal mold, press molding with a compression ratio of 1.10 to 1.30 to form a molded plate and curing and hardening said molded plate into a final plate.

4,160,492

CONTROL SYSTEM FOR MOBILE SELF-PROPELLED AERIAL LIFT

Roger L. Johnston, Muskego, Wis., assignor to Simon-Krause, Inc., Milwaukee, Wis.

Filed Oct. 6, 1977, Ser. No. 840,012
Int. Cl.[2] B66F 11/04
U.S. Cl. 182—2 8 Claims



1. In an aerial lift machine:

a movable work platform;

a hydraulic motor operable at variable speeds to move said work platform;

a pump having a pressure port and a control port and being of a type wherein a change in the rate of fluid flow to said control port effects a change in the fluid pressure at said pressure port;

means for driving said pump;

a conduit for supplying fluid from said pressure port to said control port;

a selector valve operable to permit fluid flow from said pressure port to said hydraulic motor;

means located on said work platform for operating said selector valve;

a modulatable flow control valve connected to said conduit for controlling the rate of fluid flow to said control port to thereby control the speed of said hydraulic motor when said selector valve is operated;

and means located on said work platform for modulating said flow control valve.

4,160,493

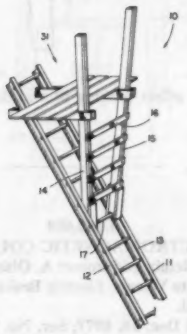
PLATFORM ATTACHMENT

Robert D. Brice, 537 Yandees St., Franklin, Ind. 46131

Filed Jan. 3, 1978, Ser. No. 866,265

Int. Cl.[2] **E06C** *7/16;* **E04G** *1/30*

U.S. Cl. 182—122 **10 Claims**



1. A platform attachment, for a ladder having side rails and several rungs extending therebetween, which comprises:

first and second posts, each post having a first end and a second end,

first attachment means for attaching said first post to a first ladder rung with the first end of said first post supported upon the first ladder rung;

second attachment means for attaching said second post to the first ladder rung with the first end of said second post supported upon the first ladder rung;

a cross member connected to and extending between said first and second posts;

a first pair of arms, each of said first pair of arms having a first end and a second end, the first ends of said first pair of arms being pivotally attached to said first post on opposite sides of said first post;

a second pair of arms, each of said second pair of arms having a first end and a second end, the first ends of said second pair of arms being pivotally attached to said second post on opposite sides of said second post;

third attachment means for attaching the second ends of said first pair of arms on opposite sides of a first ladder rail with one of said first pair of arms supported upon a second ladder rung;

fourth attachment means for attaching the second ends of said second pair of arms on opposite sides of a second ladder rail with one of said second pair of arms supported upon the second ladder rung;

a platform; and

mounting means for removably mounting said platform upon said first and second pairs of arms between said posts and the ladder.

4,160,494

FLUID-DYNAMIC EMERGENCY BRAKES

Joseph McCambridge, 12 Watson La., Setauket, N.Y. 11733

Filed Jul. 28, 1977, Ser. No. 819,938

Int. Cl.[2] **B60R** *19/02;* **B61F** *19/04*

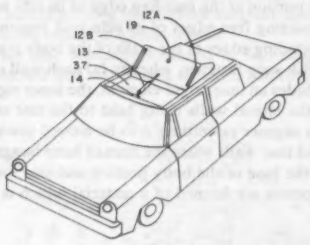
U.S. Cl. 188—270 **19 Claims**

1. Apparatus for fluid-dynamic braking of a high speed vehicle comprising:

(a) a wing member attached to said vehicle and positioned generally transversely across said vehicle,

(b) an elevator attached to the rear portion of said wing member,

(c) a rudder attached to said wing member and positioned generally in the vertically plane,



(d) an eductor symmetrically positioned in said elevator surface,

(e) means for positioning the upper surface of said elevator surface at an angle in the range from 0° to 180° with respect to the upper surface of said wing member, and

(f) means for positioning said wing at an obtuse angle to said vehicle.

4,160,495

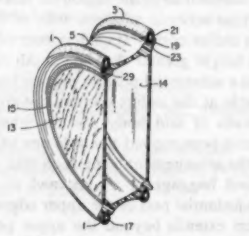
SUITCASE WITH TRANSPORTING RIMS

Donald D. Conard, 900 N. Point St., San Francisco, Calif. 94109

Filed Feb. 16, 1978, Ser. No. 878,364

Int. Cl.[2] **A45C** *5/14*

U.S. Cl. 190—18 A **5 Claims**



1. A suitcase for rolling movement over the ground comprising: a suitcase having side walls and end wall cooperatively joined together to form an enclosed article receiving volume; at least first and second raceways mounted to the end wall of said suitcase and extending around said suitcase in an endless track; at least first and second rims forming complementary endless tracks for reception into said first and second raceways; means for permitting relative rotation between said rims and said raceways to permit rolling movement of said suitcase over said ground.

4,160,496

FOLDABLE HAND BAGGAGE

Kenneth R. Knight, 11 Kendal Close, Reigate, Surrey, England

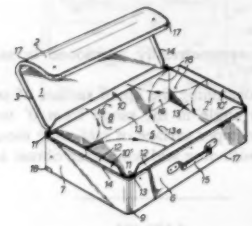
Filed May 10, 1977, Ser. No. 795,634

Int. Cl.[2] **A45C** *7/00, 13/00*

U.S. Cl. 190—43 **6 Claims**

1. A foldable item of hand baggage which comprises a body portion and rear, front and a pair of lateral walls, adjacent walls being interconnected through rounded corner sections forming an outer covering, and a hand grip attached to the front wall of the body portion, and a lid comprising a top

portion which lies parallel to said base when the item of hand baggage is in its unfolded state and closed and a side wall region at right angles thereto extending around the periphery of the top portion and providing rear, front and a pair of lateral free edges adjacent the body portion, the sidewall region extending in alignment with said walls and rounded corner sections of the body portion, the lid being attached to the rear wall of the body portion at the rear free edge of its side wall region, and the remaining free edges of its side wall region of the lid, and corresponding edges of the walls of the body portion being provided with a zip-fastener, wherein (a) each wall of the body portion includes an inner rigid element, the inner rigid element in each of the lateral walls being held to the rest of the body portion in a manner permitting it to be moved towards one of the front and rear walls when the item of hand baggage is to be folded; (b) the base of the body portion and said four walls of the body portion are formed of a material which is flexible so



as to facilitate folding; and (c) at least two intermediate members are located between the inner rigid elements and the outer covering, which intermediate members are rigid in the depthwise direction of the item of hand baggage over their entire height, are continuous in the region of, and extend around, the corner sections between adjacent walls of the body portion to constitute a radius corner at each corner of the body portion, and have a height greater than the depth of the body portion over at least a substantial portion of their length, said members being foldable at the radius corners towards one of the front and rear walls of said body portion when the lateral rigid elements have been moved towards one of the front and rear walls, and the arrangement being such that, when the lid of the item of hand baggage is zip-fastened to the body portion thereof, a substantial part of the upper edges of said intermediate members extends beyond the upper portion of the inner rigid elements associated with the walls of the body portion into the lid.

4,160,497

TRANSMISSION ASSEMBLY WITH A BRAKING DEVICE, PARTICULARLY FOR VEHICLES

Georges Galicher, Neuilly-sur-Seine, France, assignor to Etudes et Recherches Avancees, Saint-Etienne, France

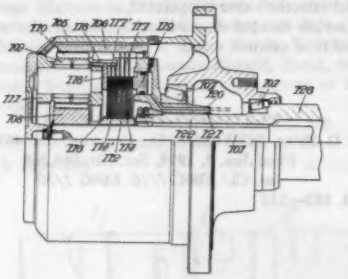
Filed Jun. 13, 1977, Ser. No. 806,305

Claims priority, application France, Jun. 17, 1976, 76 18405; Jul. 20, 1976, 76 22091

Int. Cl.[2] B60K *29/02;* **F16H** *57/10*

U.S. Cl. 192—4 A **6 Claims**

1. A transmission and braking assembly for a vehicle having a driving shaft, a driven member, a speed reduction gear system having a sun gear coupled to said driving shaft, a stationary ring gear and a plurality of planet gears in engagement therewith and mounted in a carrier coupled to said driven member, and a braking device comprising a fixed casing, at least one fixed disc mounted in said casing, and at least one rotatable disc mounted on said carrier, a sleeve keyed to said driving shaft for conjoint rotation therewith, and a plurality of brake discs mounted on said sleeve, said brake discs being mounted so as to be non-rotatable and axially slidable relative to said sleeve, and means for causing said brake discs to slide into engagement engagement with each of said fixed discs and



rotatable discs to effect braking of said driving shaft and said driven member.

4,160,498

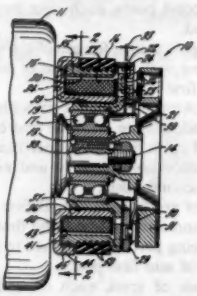
ELECTROMAGNETIC COUPLING

Paul P. Newton, Beloit, and Robert A. Olsen, Janesville, both of Wis., assignors to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Dec. 14, 1977, Ser. No. 860,582

Int. Cl.[2] F16D *27/10*

U.S. Cl. 192—84 C **6 Claims**



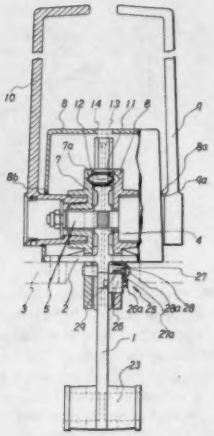
1. An electromagnetic coupling comprising an annular rotor having inner and outer concentric rings, one end of each of said rings defining a pole face, an armature mounted for rotation relative to said rotor and adapted to be drawn axially toward said pole faces by magnetic flux threading through said rotor and said armature, a stationary magnet core defined by inner and outer radially spaced concentric rings and by a bridge which spans such rings, the inner ring of said core being disposed between the inner and outer rings of said rotor and being spaced radially outwardly from the inner ring of said rotor by a narrow radial air gap of predetermined width, the bridge of said core extending alongside the opposite end of the outer ring of said rotor and being spaced axially from said opposite end by a narrow axial air gap of predetermined width, the outer ring of said core being spaced radially outwardly from the outer ring of said rotor by a narrow radial air gap of predetermined width, and means located between the outer ring of said rotor and the inner ring of said core for producing magnetic flux which threads radially across said radial air gaps and axially across said axial air gap whereby the controlled flux transfer between said core and the outer ring of said rotor occurs both in a radial direction and in an axial direction.

4,160,499

TWO-LEVER CONTROL UNIT

Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System Inc., Hyogo, Japan

Filed Sep. 12, 1977, Ser. No. 832,641
Claims priority, application Japan, Aug. 9, 1977, 52-107080
Int. Cl.[2] G05G 5/08; F16H 57/06; 192 0.096;0.098
U.S. Cl. 192—0.098 5 Claims



1. A two-lever control unit comprising:
a main body having a bore;
a shaft mounted on said main body;
a clutch operating plate rotatably supported by said shaft, said clutch operating plate being provided with three locking cavities of equal depth and having tapered walls;
a clutch lever for rotatably driving said clutch operating plate;
a throttle operating plate rotatably supported by said shaft, said clutch operating plate being provided with a locking cavity of the same depth as the clutch operating plate locking cavities and having a tapered wall;
a throttle lever for rotatably driving said throttle operating lever;
a locking rod slidably extending through said bore, said locking rod having tapered opposite ends, one tapered end being engageable in one of said three locking cavities formed in said clutch operating plate and the other tapered end being engageable in the locking cavity formed in said throttle operating plate, the length of the locking rod being equal to the length of said bore plus the depth of one of said locking cavities;
wherein rotation of one of said operating plates causes said locking rod to lock the other of said operating plates, and said tapered walls of said locking cavities and said cooperating locking rod tapered ends form ramps or release surfaces for facilitating unlocking of said locking rod from said clutch and throttle operating plate locking cavities.

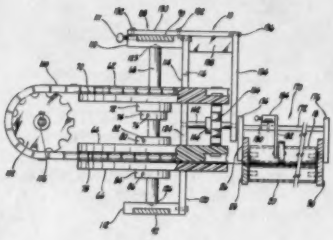
4,160,500

TURN CONVEYOR

Hubert R. VerMehren, Florissant, Mo., assignor to Ga-Vehren Engineering Company, St. Louis, Mo.

Filed Sep. 12, 1977, Ser. No. 832,401
Int. Cl.[2] B65G 47/30
U.S. Cl. 198—457 15 Claims

15. A turn conveyor for carrying a flat article from a first conveyor to a second, angularly related conveyor, said turn conveyor including:
(a) support means,
(b) a first rotatable element mounted to said support means and rotating about an axis transverse to the direction of conveyance of said first conveyor,
(c) a second rotatable element mounted to said support means and rotating about an axis transverse to the direction of conveyance of said second conveyor,
(d) an endless flexible element disposed about said first and second rotatable elements including friction means disposed outwardly of the outer face thereof,
(e) drive means moving said flexible element about said first and second rotatable elements, and
(f) a corner disc assembly mounted to said support means between said first and second elements and rotatable about



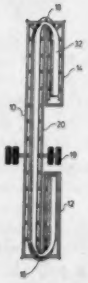
an axis transversely related to said first and second axes, said disc assembly including:
(1) shaft means,
(2) an upper guide disc receiving the upper span of said flexible element,
(3) a lower guide disc receiving the lower span of said flexible element, and
(4) a base disc disposed below said lower guide disc and having an annular surface disposed adjacent the flexible element and cooperating with said friction means to carry said flat articles in an arcuate path between said angularly related conveyors.

4,160,501

SIDE-FOLD CONVEYOR

Thorkil J. Johannsen, 2480 Mississauga Rd., Mississauga, Ontario, Canada

Filed Aug. 12, 1977, Ser. No. 824,009
Claims priority, application Canada, Jul. 19, 1977, 283012
Int. Cl.[2] B65G 21/00, 41/00
U.S. Cl. 198—632 2 Claims



1. An improved conveyor comprising an elongated hollow truss structure having a plurality of longitudinally spaced idler rolls journalled for rotation transversely thereof along its length, said plurality of idler rolls arranged to form an elongated trough shape, an elongated endless flexible belt mounted on said rolls and extending from one end of said truss structure to the other for travel in one direction on said rolls and return in the opposite direction below the rolls within the truss struc-

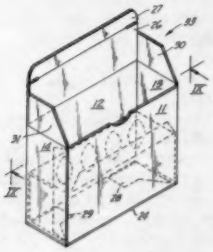
ture, said truss structure comprising at least two sections pivotally joined together about an upright axis intermediate the ends of the truss structure, said axis free of vertical belt obstructions in proximity to adjacent upper idler rolls, for substantially pivotal horizontal movement about said axis whereby one of said sections is swingable from a collapsed position side-by-side the other section to an extended position in longitudinal alignment with the other section and whereby said belt on the rolls folds longitudinally and transversely upon itself substantially about said upright axis and foreshortens to release belt tension and the belt below the rolls is free to turn in a vertical plane about said upright axis when said truss structure is in a collapsed position.

4,160,502

PLATFORM CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 20, 1978, Ser. No. 898,468
Int. Cl.[2] B65D *5/50*
U.S. Cl. 206—45.14 **6 Claims**



1. A platform carton for fragile articles comprising:

generally parallel front and back panels, each having a top edge and a bottom edge;

generally parallel side panels connecting said front and back panels, each of said side panels having a top edge and a bottom edge;

a top cover flap extending from the top edge of said back panel, said top cover flap terminating in a tuck flap, and two side flaps, each extending from a top edge of one of said side panels;

a platform section bridging the space between said front and back panels, said platform section further comprising an integral arrangement of:

a base panel having one edge connected to said bottom edge of said front panel at a fold line, said base panel extending toward said bottom edge of said back panel,

a riser panel connected to the opposite edge of said base panel, said riser panel extending upwardly along the inner surface of said back panel,

a platform panel connected along one edge to said riser panel, said platform panel extending toward said front panel, said platform panel having at least one aperture therein for receiving a fragile article to be firmly supported by the platform carton, and

a glue flap extending from the opposite edge of said platform panel toward the top edge of said front panel, said glue flap being bonded to the inside surface of said front panel; and

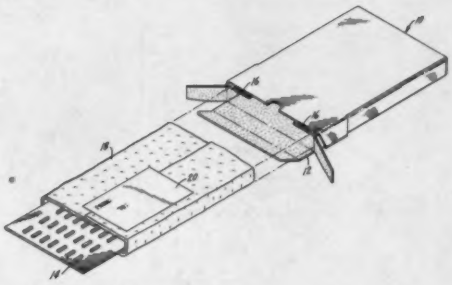
a bottom cover flap extending from the bottom edge of said back panel, said bottom cover flap including an adhesive strip adjacent its free edge for securing said flap to said base panel.

4,160,503

SHIPPING CONTAINER FOR PRINTED CIRCUIT BOARDS AND OTHER ITEMS

Ralph C. Ohlbach, 417 Green Park Ct., Deerfield, Ill. 60015

Filed Aug. 7, 1978, Ser. No. 931,867
Int. Cl.[2] B65D *81/14, 85/30*
U.S. Cl. 206—328 **5 Claims**



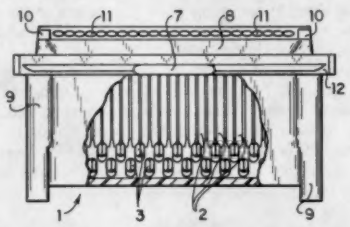
1. A paper board shipping container having at least an openable end for receiving a printed circuit board or other electronic article to be protected against a charge of static electricity, erected from folding carton board or corrugated board at least of the strength of E-flute to present six walls defining an interior cavity for insertion of said article, all inside paper surfaces opposite outside paper surfaces of the container board being coated with particles of conductive carbon black contained in a printing ink vehicle and of such concentration as to prevent a charge of static electricity originating outside the container from passing through the container, and said container containing an electronic component or module unit sensitive to a charge of static electricity.

4,160,504

PACKAGING UNIT FOR SEMICONDUCTOR DISCS

Walter Kudlich; Hans Herrmann; Gunther Lechner, and Kurt Berger, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,911
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702464
Int. Cl.[2] B65D *57/00, 85/58*
U.S. Cl. 206—334 **12 Claims**



1. A stackable, tray-type packaging unit for securing semiconductor discs, comprising:

a lower housing portion for receipt of the discs having a base, two generally upright, elongated, longitudinally-extending, spaced-apart sidewalls joined to said base and two generally-upright, laterally-extending end walls joined to said base and to said sidewalls along opposite ends thereof, said sidewalls having an inwardly-tapered lower end portion;

a plurality of parallel, laterally-extending guide ribs formed

opposite each other on said sidewalls, each adjacent pair of ribs on one sidewall cooperating with an oppositely-disposed pair of ribs on the other sidewall to serve as guides to facilitate the introduction of discs therebetween prior to their full receipt in said housing;

a plurality of stabilizing ribs each of which is formed on said base on the joining line between a pair of oppositely-disposed guide ribs, formed on said sidewalls, said ribs serving to stabilize said discs during their introduction and prior to their full receipt in said housing portion;

a plurality of centrally-notched knobs formed opposite each other on said sidewalls in said lower end portions thereof, each of said knobs on one sidewall cooperating with an oppositely-disposed knob the other sidewall to provide only two support points on which a disc may rest when fully received in said housing portion, and said knobs cooperating to maintain said discs in an upright position;

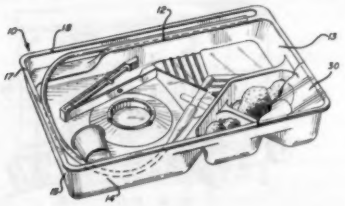
a lid for said housing including snap-fit means for releasably securing said lid to said sidewalls and endwalls of said housing portion, said lid having an inner surface and having formed on its inner surface two parallel, longitudinally-extending rows of downwardly-directed retention cones, each adjacent pair of cones in one row of which cooperate with an adjacent pair of cones in the other row to provide a maximum of two support points which engage and support the outer periphery of a single disc, said cones and said knobs providing the sole support for said discs when fully received in said packaging unit with each disc being thus supported solely by a maximum of four support points provided by said knobs and cones.

4,160,505

CATHETERIZATION TRAY

Richard A. Rauschenberger, Brookfield, Wis., assignor to Will Ross Inc., Milwaukee, Wis.

Filed Dec. 19, 1977, Ser. No. 862,074
Int. Cl.² B65D *85/54*
U.S. Cl. 206—571 **2 Claims**



1. A catheterization tray providing a sterile, self-contained catheterization package and work area comprising:

a generally rectangular dish having a bottom, four upstanding side walls and a continuous outwardly extending flange integral with the top of said walls,

at least two independent compartments within said dish for separately retaining absorbent material in each compartment;

a wall on the bottom of said dish defining a circular recess for receiving and holding upright a specimen container;

a raised wall section in said dish extending substantially the length of said dish and having a horizontal portion and an inclined portion;

a channel adapted to receive a catheter located in the top of said raised wall and extending substantially the length of said horizontal and inclined portions; and

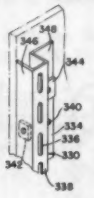
a releasable cover sheet sealed to said flange, said cover sheet being permeable to sterlizing gases.

4,160,506

SHELF-SUPPORTING STANDARDS

Bruce Young, Jr., 105 Masters Rd., Hixson, Tenn. 37343

Division of Ser. No. 679,794, Apr. 23, 1976, Pat. No. 4,083,458.
This application Feb. 17, 1978, Ser. No. 879,000
Int. Cl.² A47F *5/00*
U.S. Cl. 211—86 **2 Claims**



1. A corner connector for joining together two panels to form a corner, comprising:

a first elongate wall having a front face, a pair of longitudinal side edges and a plurality of bracket receiving openings defined therein to be spaced apart longitudinally of said first wall;

a second elongate wall attached at one longitudinal side edge thereof to one longitudinal side edge of said first wall to extend rearwardly therefrom, said second wall having a plurality of fastener receiving holes defined therein to be spaced apart longitudinally of said second wall, said second wall having a front face being a panel abutting face for abutting a first panel and another longitudinal side edge which is free and forms a panel abutting edge for abutting a second panel;

a plurality of anchor nuts attached to said second wall to be concentric with some of said fastener receiving holes with the remaining fastener receiving holes being free;

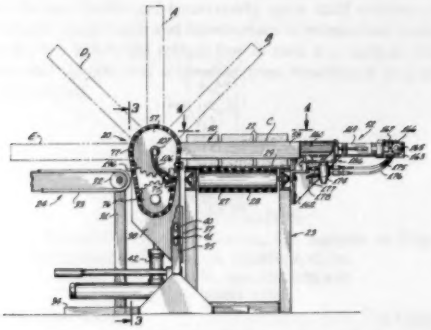
a third elongate wall attached at one longitudinal side edge thereof to another longitudinal side edge of said first wall to extend rearwardly therefrom to be in spaced parallelism with said second elongate wall;

a fourth elongate wall attached at one longitudinal side edge thereof to another longitudinal side edge of said third wall to extend at a substantially right angle thereto, said fourth wall having a plurality of fastener receiving holes defined therein to be spaced apart longitudinally of said third wall, said fourth wall having a panel abutting surface thereon for abutting said first panel, said fourth wall panel abutting surface and said second wall free longitudinal side edge being essentially coplanar with each other;

a plurality of second anchor nuts attached to said fourth wall to be concentric with some of said fastener receiving holes, with the remaining holes being free, whereby alignment of a pair of corner connectors aligns said fastener receiving holes so that a fastener inserted through a free hole in a second wall of one corner connector of a pair of corner connectors engages an anchor nut encircled hole of a second wall which is aligned therewith on the other one of the pair of corner connectors;

a plurality of fasteners some of which are inserted through a panel for engaging said anchor nuts to attach said panel to said wall the remaining fasteners being inserted through the remaining holes to engage anchor nuts on the other side of said panel whereby a pair of panels are each connected to the panel connector and are thereby connected together via the panel connector to form a corner.

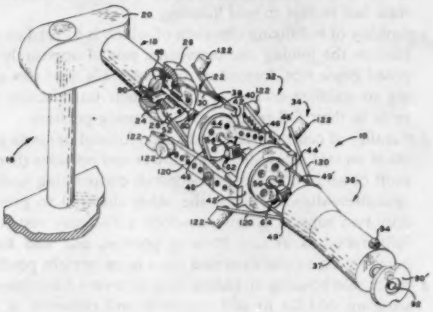
4,160,507
COMBINATION LIFT TURN-OVER/PUSH-OFF BLOCK TRANSFER APPARATUS
Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254
Filed Aug. 8, 1977, Ser. No. 822,439
Int. Cl.[2] B65G 47/52
U.S. Cl. 414—749 **6 Claims**



1. An apparatus for removing a plurality of cementitious blocks from a pallet on a first conveyor and transferring those blocks to a second conveyor in either an inverted or upright position, said apparatus comprising:
(a) a frame for aligned positioning between a block pick-up position on the first conveyor and a block delivery position on the second conveyor, said frame including a flat plate disposed between the block pick-up position on the first conveyor and the block delivery position on the second conveyor;
(b) a block lift and turn-over mechanism mounted on said frame for liftingly removing the plurality of blocks from the pallet on the first conveyor and transferring those blocks to the second conveyor in an inverted position;
(c) a block push-off mechanism mounted on said frame for pushing the plurality of blocks from the pallet on the first conveyor onto the top plate of said frame and slidingly moving the blocks across that plate onto the second conveyor; and
(d) switching means on said frame for deactivating said block push-off mechanism in a retracted inoperative position during operation of said block lift and turn-over mechanism and for deactivating said block lift and turn-over mechanism in an inoperative position which provides an unobstructed path across the top plate of said frame during operation of said block push-off mechanism.

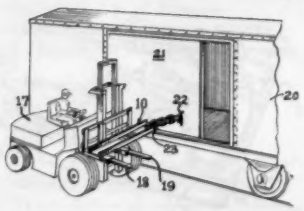
4,160,508
CONTROLLER ARM FOR A REMOTELY RELATED SLAVE ARM
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of John K. Salisbury, Jr., Palo Alto, Calif.
Filed Aug. 19, 1977, Ser. No. 826,202
Int. Cl.[2] B25J 3/04
U.S. Cl. 414—4 **11 Claims**

1. In a manipulator system characterized by an articulated slave arm having a plurality of pivotally connected segments for performing a variable task at a work site, and a controller remotely related to the work site and connected to the slave arm, the improvement comprising:
an articulated controller arm characterized by a segmented controller shaft including a plurality of controller shaft segments, each segment of said plurality being configured and dimensioned to form a miniature kinematic replica of a corresponding segment of the slave arm and supported for relative angular displacement about a pair of intersecting axes duplicatable by the slave arm, said pair of axes intersecting and defining therebetween a constant included angle of 45°;
an articulated skeletal body for supporting said controller



shaft including a plurality of pivotal segments symmetrically related to said controller shaft and supported for angular displacement about pivotal axes normally related to one axis of said pair of intersecting axes.

4,160,509
FREIGHT CAR DOOR OPENER
Ralph V. Switzer, 3410 Sunset, Waukegan, Ill. 60085
Filed Jan. 3, 1978, Ser. No. 866,532
Int. Cl.[2] B66F 9/19
U.S. Cl. 414—607 **4 Claims**

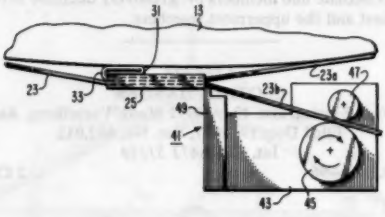


1. A freight car door opener for attachmemt to a powered industrial fork lift truck and the like providing a pair of elongated forwardly projecting prongs comprising
(a) a framelike body having a pair of elongated members extending in spaced relation to each other,
(b) a beam carried by said members and extending transversely thereto and of a length to project beyond the side of the fork lift truck,
(c) said members providing sleeves extending longitudinally therethrough and adapted to receive therein the prongs of the fork lift truck so as to attach the framelike body thereto for movement therewith,
(d) a chain connected to the end of said beam extending beyond the side of said members, and
(e) means on the end of said chain for connection to a freight car door for exerting movable force thereto parallel to the travel of the door as said fork lift truck is moved in one direction.

4,160,510
CRT WITH TENSION BAND ADAPTED FOR PUSHER-TYPE TENSIONING AND METHOD FOR PRODUCING SAME

Myron H. Wardell, Jr., Lititz, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,613
Int. Cl.[2] H01J *29/87*
U.S. Cl. 220—2.1 A 10 Claims

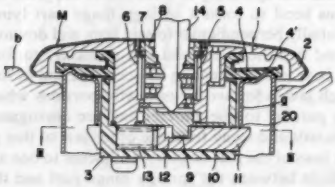


1. A cathode-ray tube in combination with a notch-sealed tension band around the tube characterized in that the inner end portion of said band adjacent said tube is folded at least twice upon itself and is positioned between the tube and the notched seal, said inner end portion comprising an extreme end, a series of connected sections of band material with a fold between adjacent sections, the one section furthest from said end being within said seal, another section connected to said one section being adjacent said tube and the remaining sections being between said another section and said seal.

4,160,511
DEVICE FOR CAPPING SUPPLYING OPENING OF FUEL-TANK

Masakazu Hukuta, Tsushima, and Hirotsugi Kobayashi, Aichi, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Sep. 7, 1978, Ser. No. 940,508
Claims priority, application Japan, Sep. 12, 1977, 52-122557[U]
Int. Cl.[2] B65D *55/14*
U.S. Cl. 220—210 4 Claims

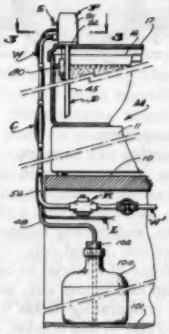


1. A device for capping a supplying opening of a fuel-tank of a motor vehicle and the like, comprises a capping outer casing, including a covering portion for covering an upper peripheral surface of said supplying opening therewith, a plug portion to be closely fitted to an inner surface of said supplying opening therewith, and means for maintaining said covering portion in a resilient condition when said covering portion is forcibly attached to said supplying opening, a pair of locking bars accommodated in a lower portion of said plug portion, said locking bar being backwardly positioned by resilient member to project from a shell of said plug portion, and cylinder-lock means mounted on said outer casing, said cylinder-lock means including a rotary member, a pair of lugs mounted on said rotary member for frictionally driving said locking bars when said rotary member is actuated, and a detachable key for actuating said rotary member, said rotary member being arranged not to permit said key to be fitted thereto for actuating said rotary member and detached therefrom even after said locking bar being fully extended without further actuation thereof through said key beyond a autorelaxing state concerning said locking bar having been frictionally driven in an autorelaxing direction thereof.

4,160,512
LIQUID METERING AND BLENDING MEANS

Robert K. Cleland, 11051 Via El Mercado, Los Alamitos, Calif. 90720

Filed Dec. 1, 1977, Ser. No. 856,313
Int. Cl.[2] B67D *5/56*
U.S. Cl. 222—56 5 Claims



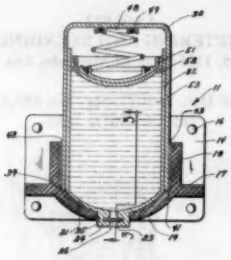
1. A proportional mixing device in combination with a non-carbonated beverage dispensing machine including a beverage holding tank with a top wall having a vertical through opening; said device is operable to intermittently deliver volumes of water with proportional volumes of liquid additive admixed therewith into the tank and includes a unitary body with a bottom surface in supported engagement with said wall, an elongate aspirator chamber with upstream and downstream ends within the body, an elongate nozzle passage with upstream and downstream ends, within the body with its downstream end concentic with and communicating with the upstream end of the aspirator chamber, an elongate water supply duct with upstream and downstream ends in the body with its downstream end communicating with the upstream end of the passage and its upstream end connected with a pressurized water supply remote from the body and the machine, an on and off valve means in the body and interposed between the ends of the water supply duct, a liquid additive port in the body communicating with the upstream end portion of the aspirator chamber, an elongate suction hose with a downstream end portion entering the body and communicating with the port and an upstream end portion extending from the body into a static supply of liquid additive remote from the body and the machine, a receiver chamber communicating with the downstream end of the aspirator chamber, an elongate delivery tube with an upper end portion entering the bottom of the body and communicating with the receiver chamber and a lower end portion depending from the body through said through opening and into said tank below a normal liquid level therein, an anti-syphon vent in the upper portion of said delivery tube, and bypass means to control the flow rate and volume of additive into and through the device and including an elongate bypass duct in the body, having an upstream end communicating with the receiver chamber and a downstream end communicating with the upstream end of the aspirator chamber and manually operable metering valve means in the bypass duct and operable to adjust the pressure differential between the receiver chamber and the upstream end portion of the aspirator chamber.

4,160,513

TOOTHPASTE DISPENSER

Terry L. Cockerham, 3105 Canterbury Dr., Bloomington, Ind. 47401

Filed Nov. 7, 1977, Ser. No. 849,162
Int. Cl.[2] B67D 5/06
U.S. Cl. 222—181 10 Claims



1. A dispenser comprising:

a bracket for mounting to a support;

an elongated cup having an open end received in said bracket, with locking means thereon for locking said cup to said bracket, said cup having a plunger longitudinally movable therein, and biasing means urging said plunger toward the open end of said cup;

a disposable cartridge of material to be dispensed, said cartridge being disposed in said cup, and said cartridge and bracket having cooperating means for reception and support of said cartridge in said bracket, said cartridge having an outlet for material to be dispensed, and said cartridge having a manually operable valve associated with said outlet and operable, when manually actuated, to open said outlet for dispensing said material from said cartridge, said valve being attached to said cartridge independent of said bracket;

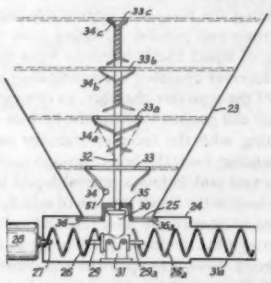
said cartridge having a movable wall engaged by said plunger when said cartridge is in said cup and supported by said bracket, said movable wall being urged by said plunger toward said outlet to pressurize said material for discharge when said valve is actuated to open said outlet.

4,160,514

DEVICE FOR FLUIDIZING AND DISCHARGING DIVIDED MATERIAL

Jean-Paul Taupin, Le Vivier, 53130 Urzy, France

Filed Dec. 9, 1976, Ser. No. 748,904
Claims priority, application France, Dec. 16, 1975, 75 38506
Int. Cl.[2] B65G 33/14
U.S. Cl. 222—228 9 Claims



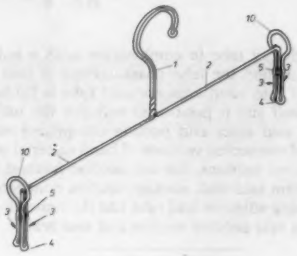
1. A device for fluidizing and discharging divided material from a silo comprising a rotatable shaft arranged to extend internally of the base of the silo, hub members carried for rotation on the shaft and extending in successive spaced planes perpendicular to the axis of the shaft, and at least one elongate flexible and deformable element attached to each of the hub members, the elements having a length no greater than the radial distance between the outer edge of the associated hub member and the wall of the base of the silo, and the hub members having different radial dimensions so that for the lowest member nearest the bottom of the silo the radial dimension is at a maximum and for the uppermost member nearest the top of the silo the dimension is at a minimum, and the dimensions of the intermediate hub members progressively decrease between the lowest and the uppermost members.

4,160,515

CLOTHES HANGER

Ernst Frei, Markstrasse 40, A-6971 Hard, Vorarlberg, Austria

Filed Dec. 19, 1977, Ser. No. 862,012
Int. Cl.[2] A47J 51/14
U.S. Cl. 223—96 2 Claims



1. A clothes hanger which is integrally formed from a single piece of wire and comprises an upwardly projecting hook, two arms extending from the hook in opposite directions, and, at the free end of each of the arms, a downwardly projecting pair of spring jaws adapted to grip an article of clothing and opening and closing by a relative swinging movement in planes laying substantially perpendicular to the extension of the arms, wherein each of the pair of jaws is formed by the wire leading from the end of a respective one of the arms bent substantially 90° downwardly and extending downward to a 180° bend to form a free end and upwardly to form one of the jaws, over an open, bulbous bend to form a springy hinge part lying in a plane substantially perpendicular to said arm, and downwardly to a 180° bend to form a free end and upwardly to form the other of the jaws and terminating adjacent the end of the arm, whereby each jaw is formed by two wire portions which run substantially parallel to one another and are corrugated in a direction towards and away from the other jaw of that pair so that the two jaws of the pair lie closely adjacent to one another at two positions between the springy hinge part and the free ends of the jaws and bulge apart between these two positions, and the free ends of the two jaws diverging away from one another to admit clothing to said jaws.

4,160,516

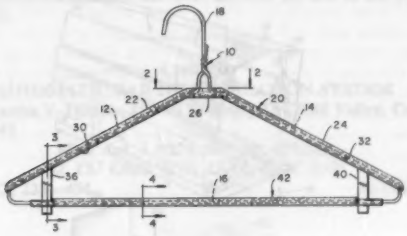
GARMENT HANGER CONSTRUCTION

Marjorie L. Rice, 1507 SW. Blvd., Kansas City, Kans. 66103

Filed Aug. 3, 1978, Ser. No. 930,687
Int. Cl.[2] A47J 51/086
U.S. Cl. 223—98 2 Claims

1. A garment hanger construction comprising a wire garment hanger including a triangular garment hanger portion having a pair of downwardly inclined hanger bars joined together at their lower ends by a pants bar and with a suspending hook extending upwardly from the juncture of said hanger bars, a hanger bar attachment secured on said hanger bars, said hanger bar attachment including a pair of hanger bar attachment elements of substantially greater width than said hanger

bars and each having a groove on the underside thereof in which said hanger bars are received, said hanger bar attachment elements being joined together at their upper ends, an opening at the juncture of the hanger bar attachment elements, said suspending hook extending through said opening, strut means extending downwardly from each of said hanger bar attachment elements into engagement with said pants bar, a pants bar attachment of substantially greater width than said pants bar, secured on said pants bar, said pants bar attachment



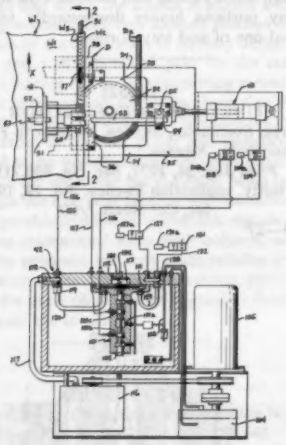
having a groove on the underside thereof in which said pants bar is received, and strut means extending from each end of the pants bar attachment, each into engagement with the strut means of one of the hanger bar attachment elements; said strut means of the hanger bar attachment elements comprising a pair of spaced apart struts which extend around said pants bar, said strut means of said pants bar attachment each comprising a pair of spaced apart struts which extend over the struts of the hanger bar attachment elements.

4,160,517

WEB ALIGNING APPARATUS FOR MULTI-LEVEL WEB MATERIAL

Raymond A. Buisker, Rockford, Ill., assignor to Rockford Servo Corporation, Rockford, Ill.

Filed Jan. 9, 1978, Ser. No. 868,046
Int. Cl.[2] B65H *25/26*
U.S. Cl. 226—19 **12 Claims**



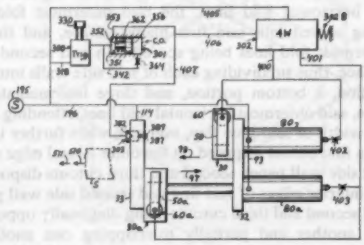
1. A web aligning apparatus for use with multi-level web material having a backing and a pile on the backing inwardly of the edge of the latter to maintain the pile edge in a preselected lateral position relative to a device that operates on the web, the web aligning apparatus including a main support adapted to be mounted at a sensing location along the course of travel of the web, a secondary support member mounted on the main support for pivotal movement relative thereto about an axis crosswise of the course of travel of the web and generally parallel to and spaced from the face of the web at the sensing location, a pile engaging member adapted to engage the pile edge, means mounting the pile engaging member on said secondary support member for movement relative thereto only along a first path crosswise of the course of travel of the web and generally parallel to the face of the web at the sensing location to sense movement of the pile edge laterally of the course of travel of the web, said pile engaging member being supported by said secondary support member for movement therewith about said pivot axis in a second arcuate path generally tangent to the course of travel of the web from a first position alongside the web backing at said sensing location toward a second position displaced along said arcuate path in the direction of travel of the web when the pile engaging member rides on top of the pile, a first motion detector for detecting movement of the pile engaging member along said first path, said first motion detector including a detector body mounted on the secondary support member for movement therewith about said pivot axis and a movable detector member connected to said pile engaging member and movable relative to said detector body for providing a signal correlative in amplitude with the position of the pile engaging member along said first path, power means for effecting relative shifting of the web and the device that operates on the web, a first control means responsive to the signal provided by said first motion detector for operating the power means to maintain the pile edge in a preselected lateral position relative to the device that operates on the web, a second motion detector for sensing movement of said pile engaging member along said second arcuate path, and additional control means responsive to said second motion detector means for operating the power means to relatively shift the web and the device that operates on the web in a direction to cause the pile engaging member to move outwardly of the pile on the web.

4,160,518

DOUBLE STROKE FEEDER

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Filed Feb. 6, 1978, Ser. No. 875,619
Int. Cl.[2] B65H *17/42*
U.S. Cl. 226—115 **30 Claims**



1. A duplex type feeder for intermittently advancing stock into the work station of a press having a reciprocating ram; said feeder being adapted to be controlled so as to execute two successive incremental stock feeding strokes in response to each cyclic operation of said press: comprising

a frame;

a pair of feed slides mounted on said frame for reciprocation in feed and index directions;

stock gripping means carried by each of said feed slides and being movable between stock gripping and stock release positions;

motor means for actuating said pair of feed slides and said stock gripping means so that each of said feed slides may be moved through feed and index strokes;

a first control means adapted to be operated in response to each cyclic operation of said press;

a second control means operative in response to the actuation of said first control means for causing one of said feed slides to execute a feed stroke; and

a third control means operative for causing the other of said feed slides to execute a feed stroke after said one feed slide completes its said feed stroke, whereby each cyclic operation of said first control means causes said two feed slides to serially execute two stock feed strokes.

4,160,519

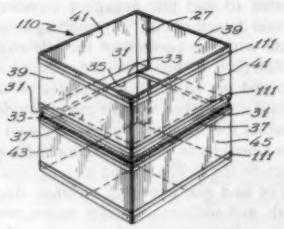
PAPERBOARD BULK BIN

Jack C. Gorham, Keokuk, Iowa, assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 809,085, Jun. 23, 1977, abandoned. This application Jun. 7, 1978, Ser. No. 913,525

Int. Cl.[2] B65D *5/02*

U.S. Cl. 229—37 R **1 Claim**



1. A paperboard blank for use in the construction of a bulk bin and having opposed first and second surfaces said blank comprising:

first and second rectangular side wall panels hingedly connected to each other in side-by-side relationship by a vertical fold line defining the inner edge of each side wall panel;

a glue flap hingedly connected to the outer side edge of said second side wall panel; and

a cover flap hingedly connected to the bottom edge of each side wall panel, each of said side walls having four, parallel, horizontal fold lines, the two outermost fold lines being scored into said first blank surface, and the two innermost fold lines being scored into said second blank surface, thus subdividing each of said side walls into a top portion, a bottom portion, and three intermediate portions, said outermost horizontal fold lines extending across the width of said glue flap, said side walls further including a first cutout disposed on the outer lateral edge of said first side wall panel, second and third cutouts disposed on the interior edges of said first and second side wall panels, said second and third cutouts being diagonally opposed to one another and partially overlapping one another, a fourth cutout disposed on the outer edge of said second side wall panel, and a fifth cutout partially extending across the entire width of the glue flap such that said glue flap comprises a top portion, a bottom portion and two spaced apart intermediate portions, said fifth cutout being diagonally opposed to and partially overlapping said fourth cutout such that when two of said blanks are connected side by side and folded to form the bin, said cutout portions cooperate with the three intermediate portions to form on each side wall an integrally locked inwardly protruding, substantially rectangular, horizontal rib portion such that one of said intermediate portion being substantially perpenticular to the other intermediate portions which are substantially parallel to each other, said rib portion reinforcing said wall to prevent bulging as said bin is filled to near capacity.

4,160,520

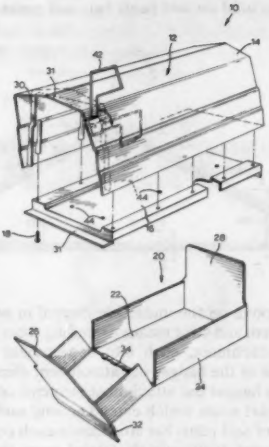
RURAL MAIL BOX

George J. Cluthé, Breslau, Canada, assignor to The Geo. Cluthe Manufacturing Co. Limited, Waterloo, Canada

Filed Mar. 13, 1978, Ser. No. 885,969

Int. Cl.[2] B65D *91/00*

U.S. Cl. 232—17 **10 Claims**



1. A rural mail box, comprising

an elongate enclosure having an open end, and

a tray slidably mounted in said enclosure and including an integral front wall closing said open end of said enclosure when said tray is located wholly within said enclosure and opening said enclosure when said tray is slid outwardly from said enclosure,

said tray being constituted by two portions hingedly connected together about a transverse hinge, whereby when said tray is slid from said enclosure a distance such that said hinge is just outside said enclosure the forward one of said tray portions hinges downwardly relative to the rearward one of said tray portions.

4,160,521

FIBRE-REINFORCED ROTOR

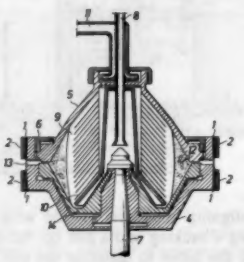
Mats Lindgren, Stockholm, Sweden, assignor to Fiber Mechanics AB, Stockholm, Sweden

Filed Jun. 24, 1977, Ser. No. 809,711

Claims priority, application Sweden, Jul. 29, 1976, 7608542

Int. Cl.[2] B04B *1/00*

U.S. Cl. 233—27 **12 Claims**



1. A fibre-reinforced rotor comprising:

an internal rotor member (3) having a substantially smooth frusto-conical outer surface;

an internally frusto-conical intermediate sleeve (1) posi-

tioned on said frusto-conical outer surface of said internal rotor member (3), the frusto-conicity of said intermediate sleeve (1) being substantially smooth and corresponding to the frusto-conicity of said internal rotor member (3); and

an external fibre-reinforced member (2) positioned coaxially about the outer surface of said intermediate sleeve (1);

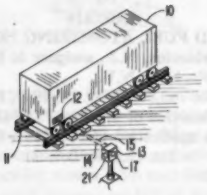
said intermediate sleeve (1) with said external fibre-reinforced member (2) being slidably attached over said internal rotor member (3) with a press fit therebetween to pre-stress said internal rotor member (3) due to the press fit.

4,160,522

AUTOMATIC CAR IDENTIFICATION SYSTEM

Daumantas V. Dikinis, 110-3B Seminary Dr., Mill Valley, Calif. 94941

Filed Apr. 3, 1978, Ser. No. 892,533
Int. Cl.[2] G06K *7/10, 19/06;* G08C *9/06*
U.S. Cl. 235—454 **16 Claims**



1. A system for identifying objects moving along a path past a stationary location comprising: means adapted to be placed at said location for defining a source of a radiation beam, said defining means being operable to direct a radiation beam in the form in a generally vertical column across the path of travel of the moving object when the source is at said location; a label adapted to be mounted on an object moveable along said path for identifying the same, the label having at least a pair of side-by-side radiation receiving and transmitting columns alignable across the path of the radiation beam when the label is on the object and when the source is at said location, each column having means selectively located thereon for blocking at least a portion of the light beam to thereby define a radiation entrance port and a radiation exit port for the column, each column further having radiation transmitting means therein for connecting the entrance and exit ports thereof so that a radiation beam entering the entrance port can pass into the column and exit therefrom at the exit ports; and radiation receiving means adapted to be placed at said location adjacent to said radiation source for receiving the radiation beam leaving each column through the exit port thereof, said radiation receiving means being operable to generate electronic signals in response to the radiation transmitted from each column, whereby the locations of the entrance and exit ports relative to a specific reference point on the corresponding column, provide a coded identification for each object to distinguish it from other objects moving past the location.

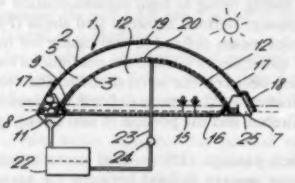
4,160,523

AIR STRUCTURE

Graham A. Stevens, 55 Colebrooke Row, London N.1., England

Filed Apr. 8, 1977, Ser. No. 786,441
Claims priority, application United Kingdom, Apr. 9, 1976, 14500/76
Int. Cl.[2] F24J *3/02*
U.S. Cl. 237—1 A **17 Claims**

1. An air-supported structure comprising a double-skin wall construction having an inner skin and an outer skin, the wall construction having the configuration of a large-span arch rising from a perimeter of the construction, the inner and outer skins being of flexible material at least substantially impermeable to air and defining therebetween an inter-skin space, the outer skin being at least substantially transparent to short wave solar radiation but relatively opaque to long wave heat radiation, air filling the inter-skin space for supporting the double-skin wall construction, and a plurality of radiation converter elements disposed in the inter-skin space, the converter elements being diaphragms spaced at intervals between the inner



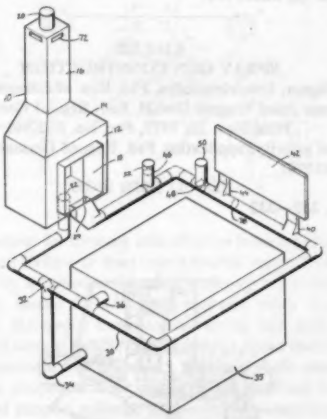
and outer skins, the diaphragms linking the skins, dividing the inter-skin space into tunnel-like spaces, and extending in parallel planes at right angles to the axis of curvature of the arch whereby the tunnel-like spaces extend upwardly from the perimeter to the apex of the arch, effective to absorb solar radiation and to convert the solar radiation to heat energy whereby the air filling the inter-skin space is heated.

4,160,524

CIRCULATING FIREPLACE WITH ADJUSTABLE CONTROLS FOR SELECTIVELY HEATING ONE OR MORE ROOMS

Clifford W. Stiber, 1958 Winterville Rd., Athens, Ga. 30605

Filed Sep. 30, 1977, Ser. No. 838,386
Int. Cl.[2] F24B *7/04*
U.S. Cl. 237—51 **1 Claim**



1. A closed loop heating system for selectively heating one or more zones within a structure, said system comprising:

(a) a metal fireplace (10) including a firebox (12) having a floor (60), two sidewalls and a rear wall for receiving the fuel to be consumed,

(b) a removable closure (18) for sealing the open face of the fireplace,

(c) a chimney (16),

(d) a combustion dome (14) joining the firebox to the chimney,

(e) said firebox, said combustion dome, and said chimney being formed of three spaced metallic shells (54, 54*a*, 54*b*; 56, 56*a*, 56*b*; 58, 58*a*, 58*b*) with air passages defined between adjacent shells,

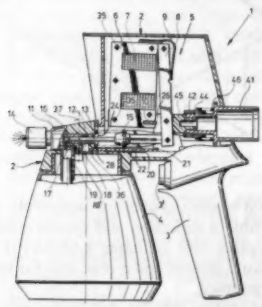
(f) the innermost of the shells (**58***b*) projecting upwardly above the other shells to function as a flue for said chimney,
(g) an annular cap (**66**) extending across the upper ends of the two outermost shells (FIG. 6),
(h) a metal casing (**62**) secured to the lower end of the outer shell with a portion of said casing extending forwardly below the floor of said firebox but spaced therefrom,
(i) said casing being in fluid communication with the tortuous passage defined between said shells (FIG. 3),
(j) air inlet means defined in said casing for freely admitting large quantities of air into the continuous tortuous passage defined between the several shells, the tortuous passage terminating in the space defined between the bottom of said firebox and the portion of said casing spaced therebelow,
(k) a first passage (**22**) in fluid communication with the tortuous passage defined between the several shells, said passage opening downwardly through the casing,
(l) a second passage (**24**) opening upwardly through the casing adjacent to the front of the firebox and in fluid communication therewith,
(m) said first and second passages normally being in direct fluid communication,
(n) ductwork (**30**) having at least one heat exchanger connected between said first and second passages for distributing heated air to the remote zones and returning the spent air to the front of the firebox, and
(o) adjustable barrier means (**64**) located in said second passage below the floor of the firebox,
(p) said barrier means being movable to a first position to block direct communication between the first and second passages defined in the firebox so that air heated along the tortuous path is forced into the ductwork for distribution,
(q) said barrier means being movable to a second position to allow unimpeded direct communication between the first and second passages in the firebox and isolate the fireplace from the ductwork.

4,160,525

SPRAY GUN CONSTRUCTION

Josef Wagner, Friedrichshafen, Fed. Rep. of Germany, assignor to Firma Josef Wagner GmbH, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,348
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1976, 2653981
Int. Cl.[2] B05B *9/043*
U.S. Cl. 239—332 **9 Claims**



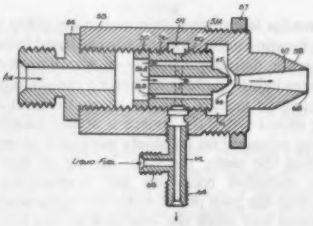
1. A spray gun for spraying liquid comprising a housing part having a suction bore and a return bore positioned rearwardly of said suction bore, a sheet metal U-shaped bridge member engageable on said housing part having first and second spaced apart leg portions and a base portion connected between said leg portions and engageable on said housing part, a spray nozzle and surge chamber member in front of said bridge member having a suction line portion engaged through the suction bore for drawing liquid into said chamber member and a return line portion engaged through the return bore, an electromagnetic pump having a coil portion connected to and supported in said bridge member on said base portion between said leg portions, a piston portion disposed with a piston part in said surge chamber of said spray nozzle and surge chamber member and an armature pivoted on said coil portion and engageable with said piston portion to advance it to move liquid taken into said surge chamber from said suction line portion out through said nozzle, means on said housing part for energizing said coil portion to move said armature, spring means biasing said armature in a return direction away from the direction of movement affected by said armature to move said armature to a return position, each of said housing part and said bridge member and said spray nozzle and surge chamber member having interengageable pin and recess means for interconnecting them together in aligned and fixed relative positions.

4,160,526

LIQUID FUEL ATOMIZING NOZZLE

Paul Flanagan, Princeton, N.J., assignor to Flynn Burner Corporation, New Rochelle, N.Y.

Division of Ser. No. 780,852, Mar. 24, 1977, Pat. No. 4,130,388, which is a continuation of Ser. No. 723,542, Sep. 15, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,769
Int. Cl.[2] B05B *7/06*
U.S. Cl. 239—427 **6 Claims**



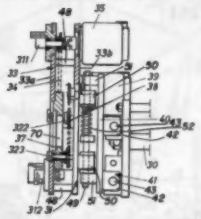
1. A liquid fuel atomizer nozzle comprising:
A. a cylindrical housing having a nose section at the forward end thereof to emit air-atomized liquid fuel, said nose section having a bore provided with a converging inlet leading to a diverging outlet;
B. an air distributor disposed within said housing at a position spaced from the inlet of the nose section to define a mixing zone, said distributor having a central air passage along the longitudinal axis of the housing and at least one off-center secondary air passage, said passages leading into said mixing zone;
C. means to feed atomizing air at high velocity into the rear end of said housing for forward flow through said passages;
D. liquid fuel supply means constituted by an annular channel which encircles the distributor at an intermediate point thereon and which communicates with radial ducts extending between the channel and the central air passage to feed liquid fuel into the central passage to be intermingled with and atomized by the air flowing therethrough, atomization taking place due to the turbulent interaction of the incoming fuel and the forwardly rushing air, whereby the liquid is projected in an atomized stream into said mixing zone, the periphery of the stream in said mixing zone being subjected to the force of the air from the secondary passage to effect further atomization thereof so that both internal and external atomization takes place within the housing.

4,160,527

APPARATUS FOR REPLACEMENT OF A CABLE DRUM OR SIMILAR OBJECT ON A SHAFT WITH ANOTHER CABLE DRUM

Sven S. Nordblad, Spånga, and Karl-Erik Svensson, Hägersten, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 7, 1977, Ser. No. 848,811
Claims priority, application Sweden, Nov. 18, 1976, 7612929
Int. Cl.[2] B65H 67/00
U.S. Cl. 242—47 7 Claims



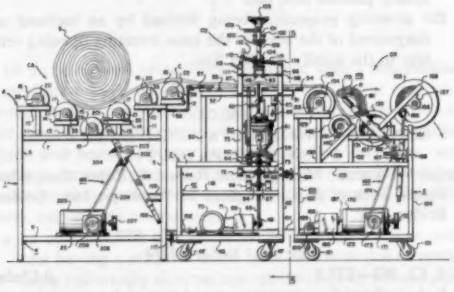
1. Apparatus for replacing an object secured to a shaft with a similar object, said apparatus comprising locking means releasably attachable to the shaft for holding an object on said shaft, said locking means including an actuable release member for releasing the locking means from said shaft, a displaceable control arm, first catch means coupled to said arm for movement therewith for releasably engaging the object secured to said shaft, second catch means coupled to said arm for movement therewith for releasably engaging said locking means, and means coupled to said arm for actuating said release member when said first and second catch means are positioned by said arm for respectively releasably engaging said object and said locking means.

4,160,528

CARPET ROLL WINDING APPARATUS

Fermer A. Malone, Sr., Kemp, and Fermer A. Malone, Jr., Duncanville, both of Tex., assignors to F. A. Malone & Son, Inc., Cedar Hill, Tex.

Filed Jan. 5, 1978, Ser. No. 867,283
Int. Cl.[2] B65H 19/20, 17/08
U.S. Cl. 242—56 R 18 Claims



1. An apparatus for unwinding a predetermined length of pliable material, such as carpet from a supply roll, for measuring, cutting and rewinding the unwound length of material into a roll comprising

first means having driven rollers forming a cradle for rotatably supporting a supply roll of pliable material and for unwinding and advancing a predetermined length thereof,

second means for receiving the unwound material from the first means and supporting said material during measurement and severing of the predetermined length of material,

the second means having means for severing the predetermined length of material and means for preventing movement of said material relative to the severing means during the cutting of said length thereof,

said second means having means mounting said severing means for pivotal movement about an upright axis to permit alignment thereof with the transverse axis of said unwound length of material,

third means for receiving said length of material from said second means and having driven rollers forming a cradle for rotatably supporting and rewinding said length of material,

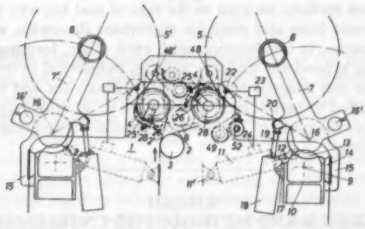
the rewind cradle being mounted for pivotal movement about an upright axis to permit continual orientation of said cradle relative to said length of material for squaring the ends thereof and preventing coning of said ends.

4,160,529

ROLLER WINDING MACHINE FOR THE FORMATION OF SINGLE REELS

Armin S. P. Hutzenlaub, Am Stichelberg 24, and Klaus Pack, Im Sonnenwinkel 16, both of 5276 Wiehl-1, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 911,047
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724955
Int. Cl.[2] B65H 35/04, 75/34
U.S. Cl. 242—56.6 10 Claims



1. In a machine for forming rolls of strips from longitudinally cut sheets and having at least one rotatable support roll for a strip, a gravity actuated arm urging a take-up roll toward said support roll, means for swinging said arm away from said support roll, means for transversely cutting said strip, and a sickle shaped table rotatable concentrically about said support roll from a position free of contact with said sheet material to a position to cooperate with said cutting means and between said strip and support roll, the improvement comprising:

at least one adhesive label dispenser swingable about an axis parallel to the axis of said support roll for movement to said support roll to place spaced adhesive labels on said strip;

means for moving said take-up roll away from said support roll to form a gap therebetween to accommodate said sickle shaped table;

a slidable cutter movable parallel to the axis of said support roll;

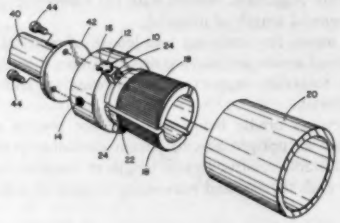
said sickle shaped table having a slit therealong between said spaced labels, to accommodate a portion of said cutter and a suction chamber on the side of said slit downstream of the direction of movement of said sheet; said table being arranged to apply pressure to a starting sleeve for a take-up roll to adhere one of said labels to said sleeve.

4,160,530

CORE CHUCK

Edward F. Plach, Appleton, Wis., assignor to Appleton Machine Company, Appleton, Wis.

Filed Jun. 15, 1978, Ser. No. 915,812
Int. Cl.[2] B65H *17/02, 75/15*
U.S. Cl. 242—68.2 3 Claims



1. A core chuck comprising:

(a) a chuck body of the lathe chuck type including a rotatable circular plate containing screw threads on one surface thereof and at least one adjustable pinion engaging said plate to control rotation of the plate,

(b) at least two counterbored, radially aligned keyways formed in said body permitting access to said threaded surface of said plate,

(c) a keyway element disposed in each of said keyways and in contact with said plate, said element including a plurality of raised segments on the plate side of said element for interengaging the screw threads on said plate, whereby the keyway element may be accurately positioned at a desired location within said keyway by rotation of said pinion,

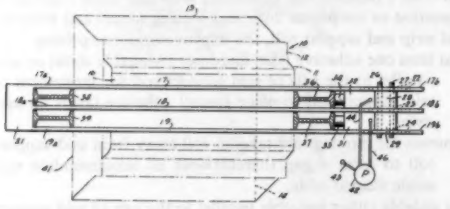
(d) jaw sections secured to the side of said keyway element remote from said plate for movement therewith, said jaw sections, in combination with each other, forming a split ring expandable gripping surface, cylindrical in cross-section and adapted to be inserted into a core and then expanded to permit each jaw section to securely engage the inner diameter of said core as function of rotation of said pinion.

4,160,531

APPARATUS AND METHODS FOR UNTELESCOPING AND REWINDING REELS OF SHEET MATERIAL SUCH AS STEEL

James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Oct. 25, 1977, Ser. No. 845,386
Int. Cl.[2] B21C *47/02;* B65H *17/02*
U.S. Cl. 242—78.1 8 Claims



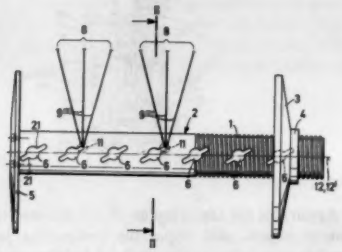
1. Apparatus for rewinding reeled material having a central opening comprising a pair of side frame members, a central shaft connected to said frame members and extendible through said central opening of said reeled material, means for clamping the outer end of said reeled material, and means for rotating the inner coil of said reeled material so as to tighten said reel, and wherein said clamping means comprises a hydraulic ram engageable with said outer end.

4,160,532

KNOT HOLE BEAM

Hans Demuth, and Walter Stumpp, both of Winterthur, Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Jun. 22, 1977, Ser. No. 809,127
Claims priority, application Switzerland, Jul. 2, 1976, 008486/76
Int. Cl.[2] B65H *75/28*
U.S. Cl. 242—125.1 5 Claims



1. A knot hole beam, especially a warp beam for a loom, for winding-up yarn or the like, comprising:

a winding tube having a lengthwise axis and a peripheral portion provided with knot holes;

an insertion bore serving for the insertion of a bundle of knotted together yarn ends provided for each knot hole;

means for providing at least one knot arresting opening merging with the insertion bore and being narrower than said insertion bore;

an arresting projection provided for each knot hole for the inserted knot, said arresting projection being disposed between the insertion bore and the knot arresting opening at least at one side of an edge of the knot hole and extending towards a line which is substantially axially parallel to the lengthwise axis of the winding tube, said axially parallel line passing through the center of the insertion bore;

said arresting projection being situated closer to said axially parallel line than an outer peripheral portion of the knot arresting opening which is situated furthest from such axially parallel line; and

the arresting projection being formed by an inclined arrangement of the sides of the knot arresting opening relative to the axially parallel line.

4,160,533

CONTAINER WITH OCTAGONAL INSERT AND CORNER PAYOUT

Frank W. Kotzur, Mahopac, and Ronald E. Zajac, East White Plains, both of N.Y., assignors to Windings, Inc., Goldens Bridge, N.Y.

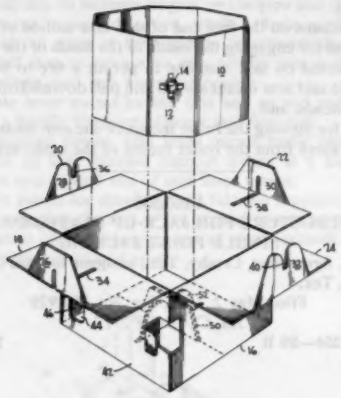
Filed Jan. 24, 1978, Ser. No. 872,018
Int. Cl.[2] B65H *49/18*
U.S. Cl. 242—137.1 6 Claims

1. A package for retaining wound material, comprising:

a container enclosing material wound in a FIGURE-8 configuration and including a radial hole extending from the central core space thereof to the outer periphery thereof, said container including a perforated portion in a corner thereof for feeding material from the winding;

a polygonally-sided insert having opposing sides engaging the outer periphery of the winding and including a feedout tube inserted in said radial hole for feeding the inner end of the material and having opposing sides engaging the

inner surfaces of the container, said feedout tube being aligned with said perforated hole; and

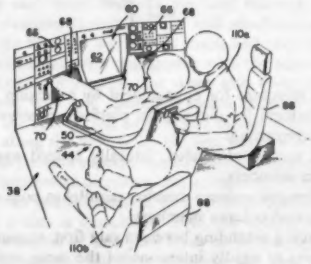


said container including bottom and upper surfaces each having intersecting cone sections for supporting the inner windings of said material.

4,160,534
OPERATING STATION FOR AIRCRAFT REFUELING BOOM

Thomas H. White, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1977, Ser. No. 865,833
Int. Cl.[2] B64D *39/00*
U.S. Cl. 244—135 A **26 Claims**



14. In an aircraft comprising a fuselage with a longitudinal centerline, a transverse axis, a forward and a rear end, said aircraft having a refueling boom extending rearwardly from said aircraft and having a refueling boom envelope within which said boom operates during a refueling operation, said envelope having upper, lower and side envelope boundaries, the improvement comprising an operating station for said boom, said station comprising:

a. an operator seat at a lower portion of said fuselage, said seat having a platform and a back rest arranged to establish a rearwardly directed eye reference point for an operator positioned on said seat,

b. two leg accommodating structures in the form of leg wells extending rearwardly and divergently from said operator seat in a manner to receive legs of an operator positioned in said seat,

c. a window structure positioned rearwardly of said eye reference point at a location between said leg accomodating structures, with said leg accommodating structures extending rearwardly from said window structure, said window structure providing a direct viewing area defined by upper, lower, and side viewing limits,

d. said seat, leg accommodating structures, and said window structure being positioned and arranged relative to each other and to said refueling envelope in a manner that:

1. the upper viewing limit through said window structure is located at least as high as a plane extending from the upper envelope boundary to the eye reference point,

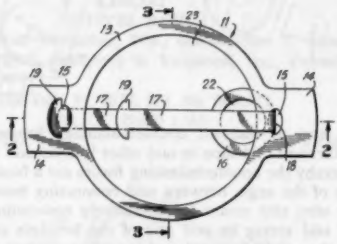
2. said leg accommodating structures and the side viewing limits through said window structure are positioned laterally outside of planes extending from the refueling envelope side boundaries to the eye referenece point,

3. the lower viewing limit of the window structure is below a plane extending from the lower envelope boundary to the eye reference point.

4,160,535
CONICAL FILTER HOLDER

Thomas S. Wallsten, Chapel Hill, N.C., assignor to Berkshire Paper Company, Great Barrington, Mass.

Filed May 3, 1978, Ser. No. 902,295
Int. Cl.[2] B01D *23/28*; B65B *39/00*; B67C *11/00*
U.S. Cl. 248—94 **9 Claims**



1. A filter holder transferrable between a lay flat collapsed condition and an expanded operable condition comprising a first substantially flat frame member formed from a flexible sheet material having a relatively large first opening, a second substantially flat frame member also formed from a flexible sheet material having a relatively small second opening and collapsable support means for suspending and deforming said second frame member below and substantially parallel to said first frame member with said first and second openings in vertical coaxial alignment when said first filter holder is in its expanded condition, said support means being collapsable to said holder lay flat collapsed condition with said first and second frame members and said support means lying along and proximate a common flat plane; said first and second frame members being united to each other by means to enable said frame members to slide to and from their expanded and collapsed conditions.

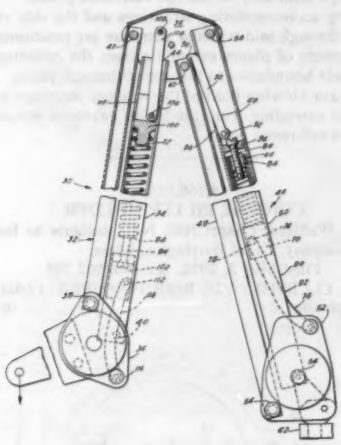
4,160,536
COUNTERBALANCED ARM

Jens C. Krogsrud, Oslo, Norway, assignor to Jac. Jacobsen A/S, Oslo, Norway

Continuation-in-part of Ser. No. 735,988, Oct. 27, 1976, Pat. No. 4,080,530. This application Mar. 20, 1978, Ser. No. 888,576
The portion of the term of this patent subsequent to Mar. 21, 1995, has been disclaimed.
Int. Cl.[2] F21V *21/26*
U.S. Cl. 248—280.1 **17 Claims**

1. A counterbalanced arm assembly comprising, in combination, a parallelogram arm assembly including a pair of parallely extending arms and a pair of brackets respectively positioned at opposite ends of said arms; means for pivotally connecting each end of each of said arms to its adjacent bracket at pivot axes whereby the arms and brackets define a parallelogram; at

least one of said arms being hollow and defining an elongated cavity therein; an extensible spring positioned within said cavity; means for operatively connecting one end of said spring to one of said brackets; a shoe operatively connected to the other end of said spring and being slidable within said hollow arm and means for operatively connecting said shoe to the other of said brackets along a line which is at an angle to the



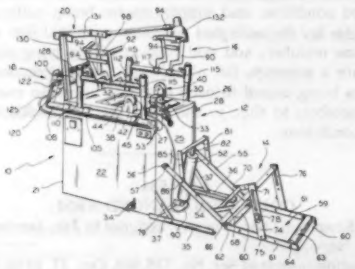
hollow arm to transmit counterbalancing forces from the spring through said shoe to said other bracket and arm assembly whereby the counterbalancing forces are a function of the tangent of the angle between said connecting means and the hollow arm; said means for operatively connecting said one end of said spring to said one of the brackets comprises a second shoe slidably positioned in said cavity and a rigid link operatively connecting said one bracket to the second shoe.

4,160,537

TIRE SPREADING AND INSPECTING MACHINE

Larry A. Severson, West Fargo, N. Dak., assignor to Applied Power, Inc., Milwaukee, Wis.

Filed Jan. 23, 1978, Ser. No. 871,529
Int. Cl.[2] B60C *25/14*
U.S. Cl. 254—50.3 **30 Claims**



1. A machine for rotating and inspecting a tire comprising:

a support assembly for supporting a tire in a vertical position, said support assembly including drive means for rotating a tire about its axis,

two tire bead spreading arm means mounted to said support assembly, said arm means being adapted for spreading apart the beads of a tire to permit inspection thereof and including an offset whereby said beads are also pulled downwardly by said arm means, each of said arm means including at least one arm element comprising first and second perpendicular elongate sections and a third section connected to the free end of said second section, an obtuse angle being formed between said second and third sections,

roller means on the free end of said first section of said arm means for engaging the inside of the beads of the tire to be inspected on said machine to permit a tire to be rotated while said arm means spread and pull downwardly on said tire beads, and

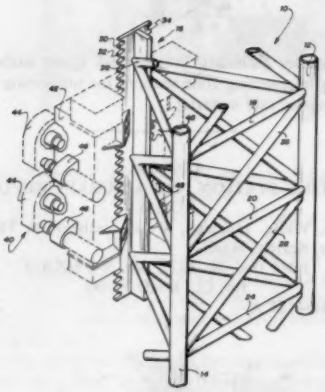
means for moving the roller means of one arm means toward and away from the roller means of the other arm means.

4,160,538

LEG STRUCTURE FOR JACK-UP PLATFORM WITH SINGLE POINT JACKING

James E. Armstrong, Crosby, Tex., assignor to Pool Company, Dallas, Tex.

Filed May 2, 1977, Ser. No. 792,929
Int. Cl.[2] B66F *7/12*
U.S. Cl. 254—89 R **11 Claims**



1. A leg structure for engagement by a jacking unit on an offshore platform for moving the platform relative to the leg structure, comprising:

first and second elongated, laterally spaced apart parallel column members;

a third elongate column member parallel to both of said first and second column members;

cross-bracing extending between said first, second and third members to rigidly interconnect the same and provide a unitary structure having a triangular cross-sectional configuration; and

a single elongated rack means carried on said third elongate member to provide for jacking of the leg only on said rack means, said rack means comprising a flat, plate-like member having a set of rack teeth extending along each edge for meshed engagement with a separate one of a pair of pinions on the jacking unit.

4,160,539

HAND OPERATED JACK FOR A MULTIPURPOSE JIG APPARATUS OF THE TYPE INCLUDING A LENGTH OF PIPE AND A PLURALITY OF RELEASABLE, PIPE-GRIPPING TAIL STOPS

Harold R. Johnson, Ste. 102, 195-21st, West Vancouver, British Columbia, Canada V7V 4A4

Filed Jan. 26, 1978, Ser. No. 872,468
Int. Cl.[2] B66F *1/02*
U.S. Cl. 254—106 **13 Claims**

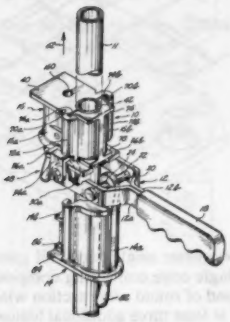
1. A manually operated jack lever for use with a jig apparatus of the type that includes a rigid, elongate section of pipe

and at least first and second tail stops mounted on the pipe and each releasably gripping it in such a manner that a force applied to either of said tail stops in one lengthwise direction causes the tail stop to increase its grip on the pipe and thereby resist movement in such direction, while a force applied to either of said tail stops in the opposite lengthwise direction causes the tail stop to release its grip on the pipe and slide freely therealong, said jack lever comprising:

an elongate lever means having first and second ends and having a handle disposed adjacent said first end;

fulcrum support means, said lever means being pivotally mounted on said fulcrum support means at a location adjacent said second end of said lever means;

attachment means for attaching said fulcrum support means to a pipe so that the axis of the pivotal mounting of said lever means on said fulcrum support means extends transversely adjacent to said pipe;



camming means affixed to said lever means adjacent the second end thereof for movement generally lengthwise of the pipe in the reaction to manual reciprocation of said handle of said lever means when said fulcrum support means is attached to said pipe, by said attachment means, between the first and second tail stops, and said camming means being detachably engageable with the adjacent end of the second tail stop so that when said lever means is stroked one way said camming means thereon forcibly displaces the second tail stop in said opposite lengthwise direction along the pipe while the first tail stop reactively braces said fulcrum support means against displacement in said one lengthwise direction and so that once the second tail stop has been displaced to a desired position, said camming means is detachable from the second tail stop allowing removal of said jack lever from the pipe while leaving the second tail stop gripping the pipe at such desired position.

4,160,540

FAST ACTION DISCONNECT FOR USE ON A DOG NUT OF A POWER LINE INSULATOR AND THE LIKE

Keith E. Lindsey, Pasadena, Calif., and Hoyt W. Bozeman, Jr., Arlington, Tex., assignors to Lindsey Manufacturing Company, Azusa, Calif.

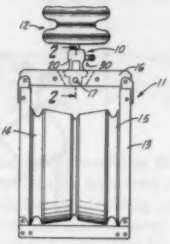
Filed Dec. 27, 1977, Ser. No. 864,669
Int. Cl.[2] B66D *1/36*
U.S. Cl. 254—134.3 PA **8 Claims**

1. A fast action disconnect for use in detachably connecting equipment to the dog nut of a power line insulator comprising:

a rigid body member having means for connecting the same to equipment at a first end thereof;

the opposite end of said body member having a T-shaped passage opening through one lateral side and the adjacent end of said main body and having a socket at the junction of the T-stem and T-head thereof for receiving and seating a dog nut at the lower end of a power line insulator;

barrier means supported in a portion of said T-head for movement between a retracted position effective to lock a dog nut positively assembled within said passage and an extended position permitting free movement of a dog nut into and out of assembly into said passage; and



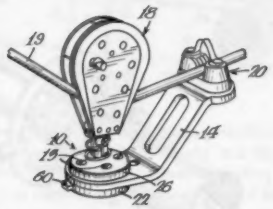
said barrier means including manually-controlled spring biased means cooperating with said main body effective to lock said barrier means in said extended position.

4,160,541

SWIVEL BASE

Peter O. Harken, Pewaukee, Wis., and William E. Lawson, Stillwater, Minn., assignors to Vanguard, Inc., Pewaukee, Wis.

Filed Dec. 27, 1977, Ser. No. 864,512
Int. Cl.[2] B66D *1/36*
U.S. Cl. 254—192 **6 Claims**



1. A swivel base for rotatably supporting a bearing block and one end of an arm having a line securement device at the other end, said base comprising a pair of interfitting plate members, one of said plate members having a boss forming a connecting central portion between said plate members, means in said central portion for rotatably receiving a support post for said bearing block, said one end of said arm having an opening extending around said central portion, an annular recess between each of said plates and said one end of the arm located outwardly of the opening therein, and a plurality of rotatable bearing means in each annular recess for rotatably supporting opposite surfaces of said arm.

4,160,542

POST AND RAIL INTERCONNECTION

Donald R. Winters, 1810 S. 11th St., Yakima, Wash. 98903

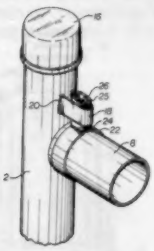
Filed Jun. 2, 1978, Ser. No. 912,062
Int. Cl.[2] E04H *17/06*
U.S. Cl. 256—70 **7 Claims**

1. Means for securing a horizontal fencing member to an upright, comprising:

an outwardly extending, generally horizontal, loop member on the upright, wherein the opening in the loop member faces in a substantially vertical direction; and

a collar member on the horizontal member, said collar member having first and second radially outwardly extending portions, said first and second portions being so spaced

and of such a resilient material that they may be squeezed toward each other from a rest position and slipped through the opening loop in the loop member, where,



upon rebound to their rest position, said first and second portions act to secure the horizontal member to the upright.

4,160,543

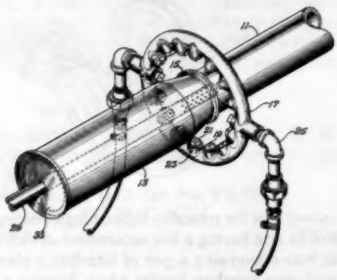
HEAT TREATMENT OF WELDS

Herbert C. Dill, and Allen E. Wisler, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 741,006, Nov. 11, 1976, abandoned, which is a division of Ser. No. 524,919, Nov. 18, 1974, Pat. No. 3,997,374, which is a continuation of Ser. No. 269,648, Jul. 7, 1972. This application Nov. 25, 1977, Ser. No. 854,963

Int. Cl.[2] C21D *1/10*

U.S. Cl. 266—252 **6 Claims**



1. An apparatus for heat treating the weld and heat affected zone between a steel pipe and a steel connector, the apparatus comprising the combination of:

a generally ring shaped manifold;

nozzle means carried by the manifold to direct flow inwardly;

a mandrel;

nozzle means carried by the mandrel to direct fluid flow outwardly;

positioner means for controlling the axial position of the nozzle means of the mandrel so that it discharges flow against the weld and heat affected zone, and for maintaining the mandrel stationary with respect to the pipe during quenching;

heating means for heating the weld and heat affected zone, to a selected temperature across the entire cross-sectional thickness of the weld and heat affected area for hardening the entire cross-sectional thickness of the weld and heat affected zone; and

pumping means connected with the ring shaped manifold and the mandrel to supply gaseous fluid thereto for quenching the weld and heat affected area.

4,160,544

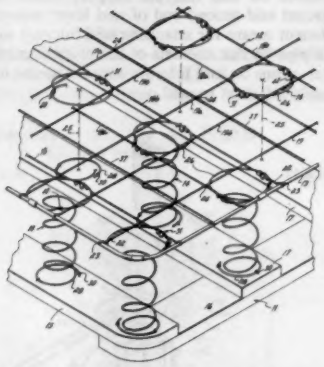
SMALL DIAMETER, SINGLE CONE COIL SPRING FOR USE IN A BOX SPRING ASSEMBLY

Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Division of Ser. No. 784,439, Apr. 4, 1977, Pat. No. 4,112,528, which is a continuation-in-part of Ser. No. 726,811, Sep. 27, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,159

Int. Cl.[2] F16F *1/08*

U.S. Cl. 267—166 **3 Claims**



1. A small diameter single cone coil spring for use in a box spring, said single cone coil spring comprising

a single strand of round cross section wire formed into a top loop and at least three additional helically wound loops of decreasing diameter, the end of said top loop being wrapped around the next adjacent loop to form a knot in said coil,

the improvement wherein said top loop of said spring has a diameter of less than 3½ inches so that said spring has increased firmness relative to otherwise identical springs having top loops of substantially greater diameter, and so that said spring exhibits a substantially straight line deflection curve over a major portion of its possible range of deflection.

4,160,545

FILM HANDLING APPARATUS

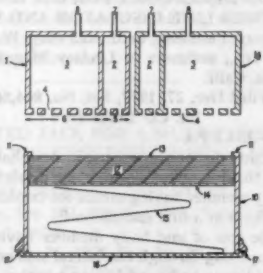
Harry A. H. Spence-Bate, 115 Cheam Plate, Morley, Australia 6062

Filed Jul. 8, 1975, Ser. No. 594,095

Claims priority, application Australia, Jul. 11, 1974, 8172/74; Jul. 23, 1974, 8301/74

Int. Cl.[2] B65G *59/04*; B65H *3/12*

U.S. Cl. 271—106 **7 Claims**



1. In a film handling apparatus which comprises a holder having means for engaging at least one marginal portion of a

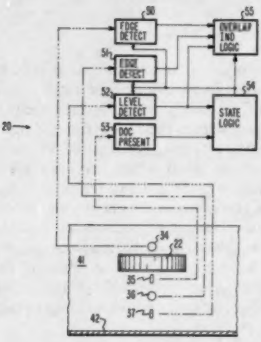
lamina positioned at a pick-up station, the improvement comprising

a handling device positionable at the pick-up station in adjacent relationship to the lamina, said device including platen means having first suction means engagable with a central area of the lamina and having additional suction means engagable with another area of the lamina adjacent the lamina edge, the first suction means and additional suction means forming a plane platen face, and means to apply suction first to said first suction means and thereafter to apply suction to said additional suction means.

4,160,546
DOCUMENT OVERLAP-DETECTING APPARATUS AND PROCESS

Andrew H. McMillan, Wayne, and Daniel A. Wisner, Milan, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1977, Ser. No. 873,082
Int. Cl.[2] B65H 7/12
U.S. Cl. 271—263 **21 Claims**



20. A process for moving documents and detecting when documents are overlapped, comprising:

(a) providing a transport path for guiding the documents;

(b) moving documents along the transport path;

(c) indicating when the present translucency of a first portion of one of the documents has suddenly changed significantly from the immediately previous translucency of the same document;

(d) indicating when the present translucency level of a second portion of the same document differs by at least a given amount from the translucency level prior to the sudden change in translucency; and

(e) indicating overlapped documents when

(1) there is coincidence between the output indications of steps c and d; and

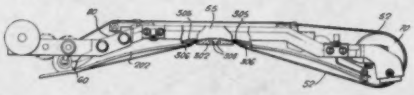
(2) the output indication of step d continuously exists for a given time.

4,160,547
DOCUMENT HANDLING APPARATUS

Peter Barton, Sling near Coleford, and Philip W. J. Lamb, Herom Estate, both of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1977, Ser. No. 780,894
Claims priority, application United Kingdom, Jun. 25, 1976, 26584/76
Int. Cl.[2] B65H 5/02
U.S. Cl. 271—275 **14 Claims**

1. In a document handling apparatus including a document-transport belt for engaging a document on a document-receiving surface and means for driving the belt to convey a said document across the surface; a document hitch supporting the belt intermediate document engaging zones thereof spaced apart in the direction of travel of the belt; said hitch comprising a base portion defining a surface supporting the belt and sidewalls for guiding the belt, the base portion having a transversely extending channel in the belt-support surface defining at least one cleaning edge, said cleaning edge including a sharp

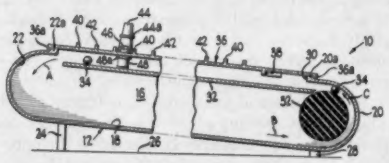


corner that deforms the belt whereby as the belt passes over said edge it is scraped clean of undesired materials; wherein said hitch member comprises a moulding of plastics material; wherein said sidewalls of said hitch member include longitudinal depressions to permit said member to be received as a snap fit to insert said member in a support.

4,160,548
ACTION GAME APPARATUS

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 23, 1977, Ser. No. 854,220
Int. Cl.[2] A63F 9/14
U.S. Cl. 273—1 M **8 Claims**



3. A game apparatus, comprising:

a thin transparent sheet forming a playing surface;

magnetic means manually movable over one face of said playing surface, said magnetic means including a magnet face movable in contact with said one face of the playing surface;

a magnetic playing piece positioned on an opposite face of said playing surface attracted by said magnetic means for movement therewith, said playing piece including a magnet face movable in contact with said opposite face of said playing surface when held against said face by magnetic attraction from the magnet face of said magnetic means in juxtaposition therewith with said transparent sheet therebetween;

a goal including wall means on the opposite face of said sheet for limiting movement of said playing piece in at least one direction on said face when said playing piece is positioned in said goal; and

wall means on said one face including a plurality of wall segments defining at least one tortuous path for movement of said magnetic means toward said goal.

4. A game apparatus, comprising:

a thin transparent sheet forming a playing surface;

a manually movable magnet for movement over one face of said playing surface;

a magnetic playing piece positioned on an opposite face of said playing surface and attracted by said magnet for movement therewith toward a goal; and

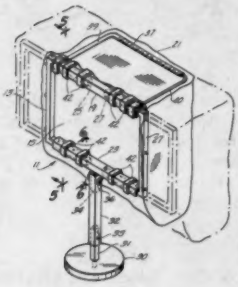
means for breaking the magnetic holding attraction between said magnet and said playing piece, said means comprising an apparatus for shooting projectiles randomly to strike said playing piece and knock said playing piece away from a position of concentrated magnetic attraction between the playing piece and said magnet.

4,160,549

TENNIS SERVE TRAINING AND PRACTICE DEVICE

John P. Simpson, 36 Winthrop Rd., Brentwood, N.Y. 11717

Continuation-in-part of Ser. No. 726,676, Sep. 27, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 871,082
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A 8 Claims



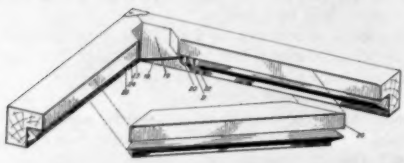
1. A tennis serve training device having an adjustable frame defining an adjustable target area, said frame defining a rectangular enclosure through which a tennis ball may pass; said frame including two mutually slidable U-shaped members having upper and lower legs and an upper and lower tubular member intermediate said U-shaped members for receiving respectively, said upper and lower legs of said U-shaped members; and coupling means for releasably coupling said frame members in selected adjusted position; a base, an upright means attached to said base and supporting said frame, a U-shaped brace, said brace comprising a pair of angle members, one end of each angle member releasably connected to the upper part of respective U-shape members of said frame and the other end having telescoping means for adjusting one angle member with respect to the other whereby said brace is adjustable with said frame, said U-shaped brace extending laterally from said upper part of said frame; a net, said net being suspended over said brace and being connected with upper and lower parts of said frame and defining a relatively large pocket for receiving and collecting balls passing through said frame, said net being connected to said frame by a plurality of snap fasteners.

4,160,550

GOLF PUTTING FRAME GAME DEVICE

Donald R. Barrett, Rte. 1, Box 116, Gable, S.C. 29051

Filed Jan. 9, 1978, Ser. No. 867,679
Int. Cl.[2] A63B *69/36*; A63G *31/00*
U.S. Cl. 273—176 F 1 Claim



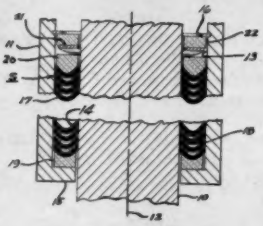
1. A golf putting frame game device played with conventional golf equipment comprising a frame suitable for use on a flat floor surface having a cushion on each interior wall thereof to provide for uniform ball rebounds during utilization of said device, a retaining projection extending over the cushion so as to retain played balls within the bounds of the frame and enhance uniformity of ball rebounds, an adjustable and removable corner capturing device, and a cushioned corner insert combined with said frame to provide a continuously cushioned interior framed wall.

4,160,551

SEAL ASSEMBLY

Jeddy D. Nixon, and Fred K. Fox, both of Houston, Tex., assignors to Engineering Enterprises, Inc., Houston, Tex.

Filed Oct. 3, 1977, Ser. No. 838,556
Int. Cl.[2] F16J *15/24*
U.S. Cl. 277—124 9 Claims



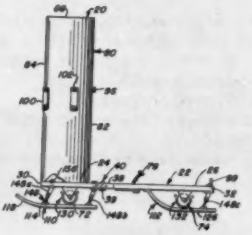
1. In apparatus wherein an annular recess is formed between the inner and outer, generally concentrically arranged cylindrical surfaces of relatively movable members; an improved assembly contained within the recess for sealing between said surfaces, comprising alternate, generally "V"-shaped layers of graphite and a spring metal which are nested within one another and which have inner and outer diameters approximating the diameters of the inner and outer cylindrical surfaces, respectively, of the recess, said layers being sufficiently thin to permit them to be flexed about their apices, in response to the predominant fluid pressure on one end of the assembly, whereby the metal layers deform the graphite layers so as to maintain their inner and outer edges sealably engaged with said recess surfaces.

4,160,552

SKI SCOOTER

Rudolph J. Kupka, 9101 Sheridan Ave., Brookfield, Ill. 60513

Filed Dec. 5, 1977, Ser. No. 857,378
Int. Cl.[2] B62B *13/08*
U.S. Cl. 280—21 R 14 Claims



1. A foot-propelled scooter, comprising:

a wheeled scooter having an elongated support platform for supporting the weight of a child, wheel means secured to the underside of said elongated support platform including at least two wheels longitudinally spaced from each other for movement upon a paved surface during summer, and steering means operatively connected to said elongated support platform for maneuvering said elongated support platform; and

removable ski means having a snow-engaging portion positioned substantially beneath the bottom of said wheel means for skiing upon snow and ice during winter, said removable ski means having snap-fitting connection

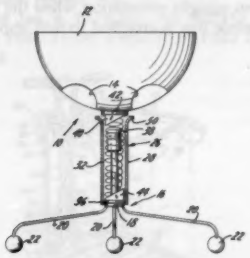
means for releasable snap-fitting interlocking engagement with said wheel means to removably connect said removable ski means to said wheel means and convert said scotter to a ski scooter in winter and vice versa.

4,160,553

CHILD HOLDING DEVICE AND JOINT THEREFOR

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Filed Jan. 12, 1977, Ser. No. 758,799
Int. Cl.² B62M *1/00*
U.S. Cl. 280—87.02 W **25 Claims**



1. A joint adapted to be used in a child holding, carrying and amusement system, said joint comprising, in combination, an outer sleeve, said outer sleeve including an upper end having a flared end portion, resilient means disposed within the outer sleeve, and a shock absorbing member employed in conjunction with the resilient means and spaced from the internal walls of said outer sleeve, said shock absorbing member including a lower portion and an upper portion, means for limiting movement of said lower portion of said shock absorbing member, whereby said upper portion of said shock absorbing member is free to move up and down and from side to side within said outer sleeve, said flared end portion of said outer sleeve permitting increased side-to-side movement of said shock absorbing member, said joint being adapted to be removably connected to and between a child holding device and a support base for said holding device, said resilient means in conjunction with said shock absorbing member providing up and down motion and side-to-side motion with respect to said outer sleeve, further including connecting means for connecting said joint to a child holding device and a support base therefor, said connecting means comprising upper connecting means connected to said upper portion of said resilient means and shock absorbing member for connecting said shock absorbing member to a child holding device, and said means for limiting movement of said lower portion of said shock absorbing member comprising lower connecting means connected to said lower portion of said shock absorbing member and said resilient means for connecting said shock absorbing member to a support base therefor.

4,160,554

SKATEBOARD ACCESSORY

Robert M. Cooney, Fullerton, Calif., assignor to Apollo Spinner, Inc., Los Angeles, Calif.

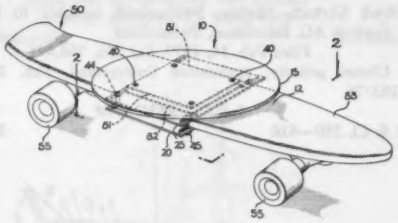
Filed Sep. 14, 1977, Ser. No. 833,182
Int. Cl.² B62K *9/00*
U.S. Cl. 280—87.04 A **20 Claims**

1. A skateboard accessory for coupling to the footboard of a skateboard, which comprises:

a platform member adapted to support both feet of the skateboard operator;

bearing means coupled to said platform member;

mounting means for coupling said bearing means to said footboard, said mounting means being adjustable for coupling to footboards of varying thickness and width, said bearing means and said mounting means adapted to allow rotation of said platform member through 360° with respect to said footboard;



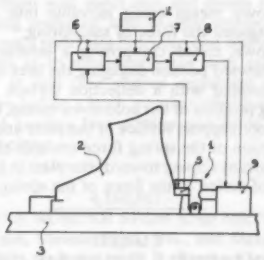
whereby said platform member is rotatable with respect to said skateboard.

4,160,555

SAFETY BINDINGS FOR SKIS

Georges P. J. Salomon, Annecy, France, assignor to S.A. des Ets Francois Salomon & Fils, Annecy, France

Filed May 13, 1977, Ser. No. 796,811
Claims priority, application France, May 18, 1976, 76 14892
Int. Cl.² A63C *9/08*
U.S. Cl. 280—612 **5 Claims**



1. A ski safety binding, said binding having an electric release, comprising: at least one boot clamping member on the ski; locking means for locking said member; a release control circuit acting on said locking means, defining means for detecting a force exercised on a skier's leg and thereafter producing an electric signal as a function of said force; threshold circuit means and means electrically controlling said locking means to effect release of said binding in response to an output of said threshold circuit, said detecting means in circuit relation to said threshold circuit, and low-pass filter circuit means interposed between said detecting means and said threshold circuit, for increasingly attenuating an output electrical signal in response to the duration of said signal coming from said detecting means which substantially follows a hyperbolic function, wherein: the attenuating circuit comprises means for suppressing the filter when the signal received becomes in value equal to the filtered signal and is defined by an arrangement formed by an operational amplifier and a diode in series, said arrangement being connected in parallel with a filter resistance.

4,160,556

HEEL OR SOLE HOLDER FOR A SOLE PLATE OF A SAFETY SKI BINDING AND SOLE PLATE EQUIPPED WITH SUCH HOLDER

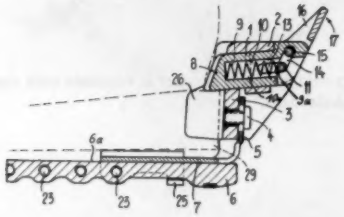
Ulrich Gertsch, Matten, Switzerland, assignor to E. & U. Gertsch AG, Interlaken, Switzerland

Filed Feb. 14, 1977, Ser. No. 768,491

Claims priority, application Switzerland, Feb. 23, 1976, 2153/76

Int. Cl.[2] A63C 9/08

U.S. Cl. 280—618 32 Claims



1. A heel- or sole holder mounted on a sole or release plate of a ski binding, comprising:

guide means on the sole or release plate;

holddown means for locking the heel or sole of a boot on the sole or release plate independent of any automatic or safety release action of the ski binding;

means for movably guiding said holddown means in said guide means for movement downwardly and at an inclination in a direction towards a plane containing said plate;

said holddown means being inclinably movable between an operating position for holding down the heel or sole of a ski boot against a support surface of said plate for supporting a ski boot thereon and an ineffectual position;

a spring for biasing the holddown means into its operating position;

said holddown means being movable into its ineffectual position against the force of said spring;

said holddown means comprising a substantially wedge-shaped forward portion engaging the heel of the boot and being provided with a deflection surface which, in the operating position of the holddown means, is located over the ski boot-support surface of the plate and is directed in the direction of the spring force towards the plate;

said guide means sloping towards the plate in the direction of the line of action of the force of the spring.

4,160,557

COLLAPSIBLE REFUSE BAG CART

Richard E. Taylor, 14487 SE. Johnson Rd., Milwaukie, Oreg. 97222

Filed Mar. 31, 1978, Ser. No. 892,167

Int. Cl.[2] B62B 11/00

U.S. Cl. 280—652 4 Claims

1. A collapsible cart for supporting and transporting flexible refuse bags comprising:

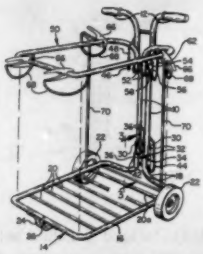
(a) medial uprights having handles located on their upper extremities, said uprights include spaced apart cylindrical tubes;

(b) lower bag support means, located at the lower extremity of said uprights, for supporting the bottom of said refuse bag, said lower bag support means includes spaced apart cylindrical end portions which extend upward perpendicularly thereto, on one side thereof, substantially coaxially with said cylindrical tubes;

(c) first connection means fixedly attached to the lower extremity of said uprights and pivotally attached to said lower bag support means in a manner so that said lower bag support means can be rotated between an operative position substantially normal to said upright support and a collapsed position substantially adjacent to and parallel with said uprights, said first connection means comprising paired, U-shaped brackets arranged to encircle associated ones of said cylindrical tubes and said end portions, fixed fasteners for fixedly attaching said brackets to said cylindrical tubes, and a pivotal fastener pivotally attaching said end portions to said brackets;

(d) locking means associated with said first connection means for locking said lower bag support means in its operative position;

(e) an open centered upper bag support located medially on said uprights and arranged for supporting said refuse bag in an open upright orientation when the upper periphery of said refuse bag is attached to said upper bag support;



(f) means for releasably attaching the upper periphery of said refuse bag to said upper bag support;

(g) second connection means fixedly attached medially to said uprights and pivotally attached to said upper bag support in a manner so that said upper bag support can be rotated between an operative position substantially normal to said uprights and a collapsed position substantially adjacent to and parallel with said uprights on the same side thereof as said lower bag support means;

(h) locking means associated with said second connection means for locking said upper bag support in its operative position; and

(i) wheels rotatably joined to said lower bag support means in a manner to allow transport of said cart thereon when said lower bag support is locked in its operative position.

4,160,558

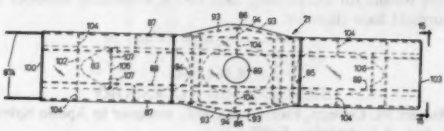
CARRIER FRAME FOR MOBILE CRANE

Robert A. Fritsch, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Oct. 19, 1977, Ser. No. 843,486

Int. Cl.[2] B62D 21/00

U.S. Cl. 280—797 13 Claims



1. A vehicle carrier frame for supporting a load near the center thereof and adapted to be supported by outriggers at opposite ends thereof, said carrier frame comprising:

a top plate having a longitudinal centerline;

and a pair of longitudinally extending hollow beams located beneath said top plate on opposite sides of said centerline and spaced apart a predetermined distance from each other, each beam comprising an upper side including a portion of said top plate, a lower side, a vertical outer side, and an inner side which slopes toward said centerline, each vertical outer side and each inner side being con-

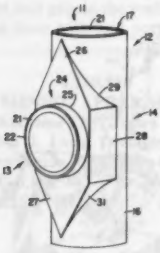
nected to and between said top plate and a lower side, said outer sides and said inner sides of said beams adapted to be in edge compression when said carrier frame is supporting a load.

4,160,559

REINFORCE TEE SECTION FOR CHIMNEY

Joseph J. Nickels, Jr., Kalamazoo, Mich., assignor to Van-Packer Co., Beach Haven, N.J.

Filed Jun. 6, 1977, Ser. No. 803,813
Int. Cl.[2] F16C 11/06; F16D 1/12; F16J 1/16
U.S. Cl. 285—156 **8 Claims**



1. A chimney section comprising:

jacket means being elongated, hollow and having open ends, said jacket means having a breeching aperture formed through a side thereof, said jacket means having a cylindrical conformation;

breech means being elongated, hollow and having open ends, said breech means being attached to said jacket means over said breeching aperture, one of said breech means open ends communicating with said breeching aperture, said breech means having first and second portions, said first portion engaging and partially encircling said jacket means, said second portion being contiguous with said first portion and extending outwardly away from said jacket means; and

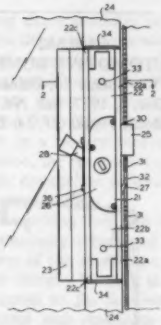
reinforcement means for strengthening and supporting said jacket means and said breech means, said reinforcement means including first and second means for stress transfer, said first means being elongated in the direction of said jacket means' elongation and having a supporting aperture formed therethrough, said second means being attached about the periphery of said first means, said reinforcement means being attached over said breech means, said breech means being received through said supporting aperture, said second means interconnecting said jacket means and said first means, said second portion being received through said supporting aperture and supported by said first means, said first means being substantially planar and having a rectangular central portion and end portions, each end portion being contiguous with, and disposed on opposite sides of, said rectangular portion, each end portion extending away from said central portion, and having side surfaces which meet, toward a jacket means' end, said supporting aperture being formed through said central portion, said second means including central and end side members, said central side members being affixed normal to, and adjacent the longitudinal edges of, said central portion, said end side members being affixed normal to, and adjacent said side surfaces of, said end portions, said central and end side members being disposed to the same side of said first means and being attached to said jacket means.

4,160,560

SLIDING DOOR LOCK ASSEMBLY

Peter F. Hauber, 7846 Shady Spring Dr., Burbank, Calif. 91504

Filed Feb. 17, 1978, Ser. No. 878,681
Int. Cl.[2] E05C 19/12; E05B 9/08
U.S. Cl. 292—101 **10 Claims**



1. A sliding closure lock assembly comprising:

a bracket adapted to be secured to said closure, comprising a bracket wall having a front wall panel with a slot therein normal to the plane of movement of said closure;

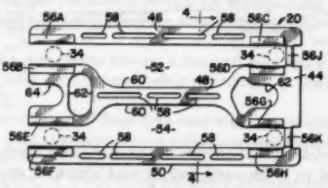
a separately formed lock cartridge comprising a housing insertable through said slot in the closure secured condition of said bracket, said housing having a front face with a dimension greater than the corresponding dimension of said slot and a projecting front face portion registered within said slot and defining a mounting locus, said housing being contoured in its longitudinal dimension for relatively angled insertion into said slot in a direction parallel to the plane of movement of said closure, and for reorientation in said plane to position said face registration with said front wall panel slot; and means rearwardly of said housing engaging said bracket cooperatively with said front wall panel slot blocking said housing into fixed engagement at its mounting locus with said front wall panel slot in said face portion registered relation, said cartridge including a latch member selectively extendible out of said housing face portion parallel to said closure movement plane.

4,160,561

VEHICLE BUMPER SHIM AND METHOD

Robert G. Farnam, Stevens Point, Wis., and Alexander Lomik, Brighton, Mich., assignors to F. D. Farnam Co., Lyons, Ill.

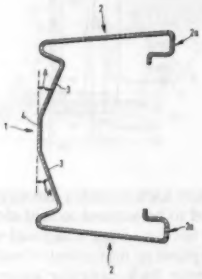
Filed Aug. 31, 1977, Ser. No. 829,451
Int. Cl.[2] B60R 19/02
U.S. Cl. 293—1 **17 Claims**



1. An article of manufacture comprising a shim for establishing a desired spacing between two vehicle components clamped toward one another by at least one shanked fastener having a head, the shim being in the form of a unitary planar body of sheet material having a thickness equal to a fraction of said spacing; at least one opening extending through said body

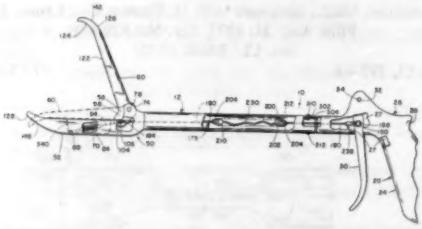
for receiving said fastener shank, a substantial portion of the surface area of the shim being a single thickness of the sheet material, said shim having at least one load bearing region on opposite sides of said opening and adapted to be positioned at least in part under the head of said fastener, said load bearing region comprising superimposed multiple thicknesses of said sheet material.

4,160,562
AUTOMOTIVE BUMPER
Giovanni Crestetto, Via Torino 73, Beinasco (Turin), Italy
Filed Dec. 5, 1977, Ser. No. 857,387
Int. Cl.[2] B60R *19/00, 21/14;* **B61F** *19/04*
U.S. Cl. 293—120 **1 Claim**



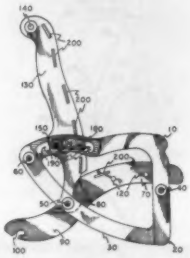
1. An automotive vehicle bumper of the type having a single shaped element of thin sheet steel having in cross-section a substantially C-shaped profile comprising a web and two flanges, wherein the free edges of said flanges are turned toward the interior of the bumper profile and wherein the end portions of the web which join the flanges are abruptly turned inwardly toward the interior of the bumper extending a given distance therein and which are thereafter turned back toward the exterior of the bumper profile tapering toward and joining an intermediate flat central portion of the web residing in the plane defined by the ends of the web, and wherein the thickness of the sheet steel is on the order of 1 to 2 mm.

4,160,563
PICK-UP TOOL
Donald S. Whitney, 1118 Baldwin St., Harlan, Iowa 51537
Filed Nov. 24, 1976, Ser. No. 744,934
Int. Cl.[2] B25J *1/00*
U.S. Cl. 294—19 R **8 Claims**



1. A pick-up tool comprising an elongated shank, a fixed jaw attached to a forward end of said shank, a moveable jaw, means attaching said moveable jaw to said fixed jaw for the pivoting of said moveable jaw about a jaw-axis disposed at a right angle to the elongation of said shank, said fixed jaw and shank defining a jaw and shank assembly, resilient means connecting said moveable jaw with said jaw and shank assembly in a manner for urging said moveable jaw into open position with respect to said closed jaw, a connection unit attached to said moveable jaw and extending rearwardly along said shank, connection unit tensioning means disposed at the rearward end of said shank and manually operable for tensioning said connection unit so as to urge said moveable jaw toward said fixed jaw, said connection unit having a flexible slacking section, a resilient assembly comprising a resilient means and means connected to said connection unit at each end of said slacking section and engageable by said resilient means in a manner such that said resilient means urges the ends of said slacking section towards each other for putting slack in said connection unit.

4,160,564
CONVERTABLE CHAIR
Gordon L. Kyle, 211 Great Neck Rd., Waterford, Conn. 06385
Filed May 19, 1978, Ser. No. 907,594
Int. Cl.[2] A47C *3/02, 13/00*
U.S. Cl. 297—131 **7 Claims**



1. An adjustable chair which can be adjusted to serve as a rocking chair when desired and as a stationary chair when desired, comprising:

a frame having two like parellel and vertically oriented side pieces, each side piece having a curved lower edge that always touches a floor;

an elongated and generally rectangular back piece with a generally rectangular platform at its top connected between the side pieces and extending generally upwardly therefrom; and

an elongated seat piece with a generally square platform in its front located between the side pieces in a generally horizontal orientation and being adjustable between a rocking chair position and a stationary chair position, with the seat piece being suspended from the floor and allowing the chair to rock on the curved lower edges of the side pieces when the seat piece is in the rocking chair position and with the seat piece touching the floor at its end remote from the platform and supporting the chair along with the side pieces when the seat piece is adjusted to the stationary chair position, the rectangular platform and the square platform always being so disposed that they form a surface which is generally L-shaped in side view to support a cushion.

4,160,565
SEAT BELT DEVICE
Katsuhiko Matsumoto, Kunitachi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 5, 1977, Ser. No. 821,994
Claims priority, application Japan, Aug. 31, 1976, 51-116604[U]
Int. Cl.[2] A62B *35/00;* **A44B** *17/00*
U.S. Cl. 297—483 **14 Claims**

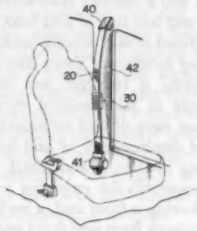
1. A one-belt type tongueless seat belt device comprising:

a belt which is fixed at one end thereof;

said belt is wound up at the other end thereof so as to be free to pay out;

said belt is payed out to be fitted and locked in its intermediate portion with a tongueless buckle so as to press the shoulder, breast and waist of a person using said belt; and

a belt grip fitted with said belt to be slidable in the lengthwise direction of said belt so as to enclose said belt;



said belt grip having hinge parts formed in the front and rear portions of said belt grip in the widthwise direction of said belt so as to be bent with said portion as hinges.

4,160,566

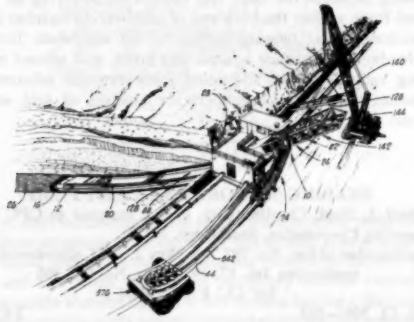
MINING APPARATUS

Dean A. McGee, Oklahoma City; James E. Ingle, Edmond, both of Okla., and Alan J. Lane, Lexington, Mass., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Feb. 14, 1977, Ser. No. 768,650

Int. Cl.[2] E21C *25/52, 29/02*

U.S. Cl. 299—30 **84 Claims**



1. A mining apparatus for forming a borehole in an earth formation utilizing a working fluid comprising:

a miner, comprising:

a frame, having a forward end, a rearward end, a first side and a second side; and

a forward cutter assembly movably connected to the forward end of the frame for excavatingly engaging the earth formation, the mined material being suspended in a working fluid thereby forming a slurry comprising the working fluid in the mined material excavated via the forward cutter assembly comprising:

a forward cutter;

a forward cutter frame having a forward end, a rearward end, a first side and a second side, the rearward end of the forward cutter frame being disposed near and spaced a distance from the forward end of the frame, the forward cutter being rotatably mounted on the forward end of the forward cutter frame for excavatingly engaging the material to be mined;

a forward cutter positioning assembly connected to the forward cutter for movably positioning the forward cutter about horizontal and vertical axes to guidingly steer the miner through portions of the earth formation;

a forward cutter drive assembly connected to the forward cutter for driving the forward cutter to excavatingly engage the materials to be mined;

a rearward cutter assembly connected to the rearward end of the frame, comprising:

a rearward cutter frame having a forward end and a rearward end, movably connected to the rearward end of the frame;

a rearward cutter rotatably mounted on the rearward cutter frame for excavatingly engaging the material to be mined;

a rearward cutter drive assembly connected to the rearward cutter for driving the rearward cutter to excavatingly engage the material to be mined; and

a rearward cutter positioning assembly connected to the rearward cutter frame for movably positioning the rearward cutter frame and the rearward cutter connected thereto in a storage position and in a material engaging position, the rearward cutter being positioned to excavatingly engage the material to be mined in the material engaging position;

means for moving the working fluid into the borehole to maintain the miner substantially submerged in the working fluid during the operation of the miner to excavate a portion of the earth formation thereby forming the borehole;

a control unit connected to the forward cutter positioning assembly, the control unit operating the forward cutter positioning assembly to position the forward cutter in predetermined positions for guidingly steering the miner through portions of the earth formation as the miner is being moved in one direction through the earth formation via the positioning of the forward cutter; and

a launching assembly for moving the miner into the earth formation and withdrawing the miner from the earth formation.

4,160,567

PNEUMATIC UNLOADING DEVICE

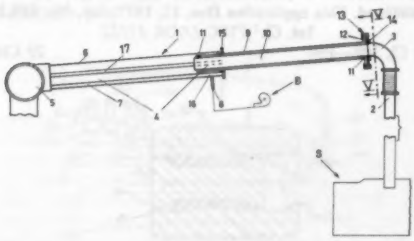
Walter Merz, Küsnacht, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 9, 1977, Ser. No. 849,950

Claims priority, application Switzerland, Dec. 13, 1976, 15675/76

Int. Cl.[2] B65G *53/20*

U.S. Cl. 406—98 **12 Claims**



1. A pneumatic conveying device for transporting material such as alumina, grain or the like from a ship's hold comprising:

at least one pipe means having a material inlet and a material outlet, said pipe means being substantially horizontally disposed;

at least one elongated fluidizing base means provided within said at least one pipe means extending substantially from said inlet to said outlet;

motive means for introducing air under pressure into said at least one fluidizing base means so as to move said material from said inlet of said pipe means to said outlet thereof;

adjustment means associated with said pipe means for varying the effective length of said at least one fluidizing base so as to optimize the conveying efficiency of said device for the particular material transported;

said adjustment means comprises a second pipe means tele-

scopically received within said at least one pipe means and movable between a first position wherein said at least one fluidizing base means is completely covered to a second position wherein said at least one fluidizing base means is completely uncovered;

said second pipe means comprises an intermediate pipe and an inner pipe, said inner pipe being provided with a curved section at the end thereof extending beyond the inlet of said at least one pipe means, said curved section being adapted with means for connecting said inner pipe to a vertical pipe;

wherein said intermediate pipe at its end adjacent said curved section of said inner pipe is provided with coupling means, said coupling means including means for connecting a coupling facility provided on said curved section of said inner pipe with a coupling facility provided on said at least one pipe section.

3. A pneumatic conveying device for transporting material such as alumina, grain or the like from a ship's hold comprising:

at least one pipe means having a material inlet and a material outlet, said pipe means being substantially horizontally disposed;

at least one elongated fluidizing base means provided within said at least one pipe means extending substantially from said inlet to said outlet;

motive means for introducing air under pressure into said at least one fluidizing base means so as to move said material from said inlet of said pipe means to said outlet thereof;

adjustment means associated with said pipe means for varying the effective length of said at least one fluidizing base so as to optimize the conveying efficiency of said device for the particular material transported;

said at least one pipe means is provided with a plurality of elongated fluidizing base means of different transporting characteristics wherein one of said fluidizing base means is functional while the others are not.

4,160,568

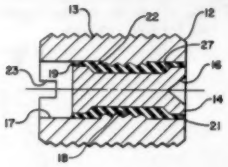
STABLE PRELOAD SHOCK MOUNTED BEARING ASSEMBLY

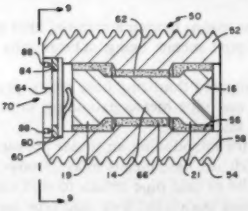
Richard D. Marquess, Concord, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Continuation-in-part of Ser. No. 673,113, Apr. 2, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,389

Int. Cl.[2] **F16C** *17/04, 17/22*

U.S. Cl. 308—159 **29 Claims**





1. A bearing assembly for engaging a pivot comprising a bearing housing having a passage extending therethrough, a land on the wall of said passage, a bearing member disposed in said passage, a bearing surface on one end of said bearing member for contact with the pivot, a shoulder on each end of said bearing member disposed in spaced relation on opposite sides of said land, and a resilient mass extending between each of said shoulders and one side of said land, whereby said bearing member is retained in said bearing housing so that transmission to said bearing member of shock and vibration applied to said bearing housing is reduced, and temperature induced dimensional change in said resilient mass produces similar force magnitude on each of said shoulders, whereby resultant force urging axial displacement of said bearing member relative to said bearing housing is minimized.

21. A bearing assembly for engaging a pivot comprising a bearing housing having a front end, a back end and a passage extending therethrough from said front end to said back end, a bearing member having a front end and back end and being disposed within said passage, said member including on the front end thereof a bearing surface located adjacent the front end of said housing and adapted for engagement with said pivot, said bearing member being axially movable within said passage relative to said housing whereby to preload said bearing surface against said pivot, first means located between said bearing housing and said bearing member for reducing the transmission to said bearing member of shock and vibration applied to said housing and for applying a shear force against said bearing member in the direction of said bearing surface for preloading said surface against said pivot, said first means being such that said shear force varies to a limited degree with changes in temperature, and second means connected with said housing adjacent the back end thereof for applying an additional force against the back end of said bearing member in the direction of said bearing surface to aid said shear force in preloading said surface against said pivot, said second means being such that said additional force remains substantially constant regardless of temperature changes at said second means.

4,160,569

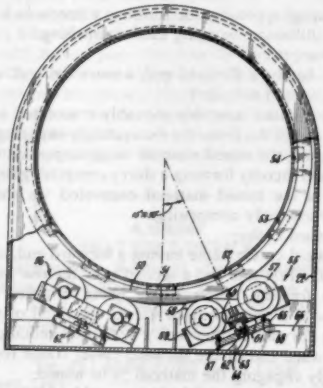
BEARING SUPPORT FOR A LIFT PUMP

Robert A. Reid, Charlton City, Mass., assignor to CPC Engineering Corporation, Sturbridge, Mass.

Continuation of Ser. No. 792,705, May 2, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,306

Int. Cl.[2] **F16C** *13/04*

U.S. Cl. 308—203 **3 Claims**



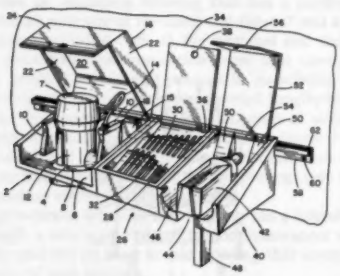
1. In a cylindrical lift pump for liquids, sewage and the like having an elongated cylindrical housing, a screw fixed within the housing and support means on at least one end thereof for rotatably maintaining said pump in a selected axial position and means for rotating said cylindrical housing, a roller bearing support for cooperating with said support means for maintain-

ing said pump in a selected inclined position, said roller bearing support comprising an annular ring surrounding and secured to said cylindrical housing, a first base member, a pair of spaced axially aligned rollers carried on one side of said first base member, said first base member having a hemispherical socket formed in the other side thereof, a second fixedly supported base member having a hemispherical socket therein, a ball bearing in engagement with both of said sockets, and said ring resting on said rollers whereby said rollers support said cylindrical housing and maintain engagement with said ring during rotation thereof without the need for flanges or other guiding means and are dynamically self-aligned with the ring and maintain line contact therewith notwithstanding deviations of said ring from a true cylindrical surface.

4,160,570
WALL MOUNTED MODULES FOR PACKAGING, MERCHANDISING AND STORAGE

John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Feb. 3, 1978, Ser. No. 874,865
Int. Cl.[2] A47F *3/14, 5/08*
U.S. Cl. 312—245 **16 Claims**



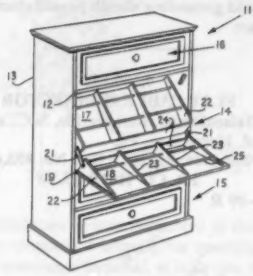
1. A merchandising display and storage module comprising a hollow structure constituted by upper and lower sections, said upper section having an exposed transverse display portion and side walls around the periphery thereof extending downwardly therefrom, said lower section having a transverse portion and side walls around the periphery thereof extending upwardly therefrom, the confronting side walls of said upper and lower sections on each side of the unit being attached to each other to form a hollow structure having a top, bottom and side walls, said upper section having at least one element formed on said transverse display portion shaped to encompass at least a portion of an article to be displayed and stored, means formed in one side wall of the unit for mounting the unit on a vertically extending supporting surface and a transparent cover extending substantially over said transverse portion.

4,160,571
SHOE CABINET

Alberto Bigotti, 1446 Pine St., San Francisco, Calif. 94109

Filed Aug. 7, 1978, Ser. No. 931,860
Int. Cl.[2] A47F *7/08*
U.S. Cl. 312—327 **1 Claim**

1. A shoe cabinet comprising:
a frame having front and rear portions,
an inner shoe-holding shelf vertically disposed within the frame with its upper end hingedly connected to the rear portion of the frame,
an outer shoe-holding shelf vertically disposed within the frame with its lower end hingedly connected to the lower end of the inner shelf, the lower end of the outer shelf also being hingedly connected to the frame along its front portion such that the outer shelf can be pivoted away from the frame to a substantially horizontal position, thereby causing the inner shelf to pivot to a diagonal position within the frame,
the inner and outer shelves further having triangularly shaped sides with their bases disposed at the lower end of each shelf and backing members running from one triangular base of each side to the other side, the shelves being hingedly connected by a metal bar running from an approximate mid-point on each of the triangular sides, the mid-point being located substantially above the base of each triangular side,

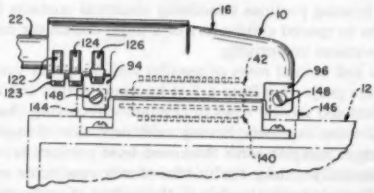


a pair of dowels spaced apart and running from one triangular side to the other for holding shoes on the shelves as the shelves are pivoted into open and closed positions, said shoe cabinet additionally comprising stops disposed on the frame toward the upper front portion thereof for limiting fold-up of the outer shelf, and two shoe compartments, each containing a pair of inner and outer shelves, with one shoe compartment being disposed above the other.

4,160,572
CONNECTOR HOUSING

Donald L. Adelberger, Dayton, and William Pangos, Centerville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 16, 1977, Ser. No. 861,318
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 P **15 Claims**



1. A connector housing comprising:
first and second sections;
means enabling said first and second sections to be assembled to form said housing;
said first and second sections being shaped to form a cable insert end and a connector opening when assembled to form said housing;
means for securing a cable in said cable insert end; and
retaining means located in at least one of said first and second sections for enabling a connector to be retained in said housing at said connector opening;
said retaining means comprising first and second areas in at least one of said first and second sections; said first and second areas having recesses therein to enable said connector to be retained therein to also provide a free floating connection with a mating connector;
said securing means comprising a securing area in each of

said first and second sections at said cable insert end of said housing;

each said securing area having an opening therein to enable a band to be passed through said openings and around said cable to secure said cable in said cable insert end;

said securing area in each of said first and second sections having a second opening therein; and

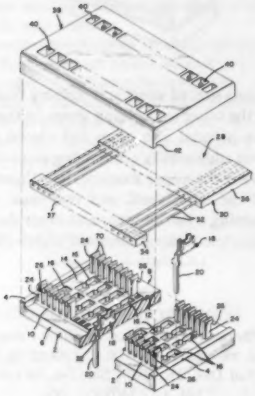
said first and second sections having an electrically conductive surface on an interior side thereof to enable a second band to be passed through said second openings and around a grounding sheath on said cable to electrically connect said grounding sheath to said electrically conductive surface.

4,160,573

FLAT CABLE CONNECTOR

Lawrence P. Weisenburger, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 21, 1977, Ser. No. 853,608
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **6 Claims**



1. In an electrical connector having first and second cooperating housing portions containing electrical contacts for connection to spaced conductors of a multi-conductor cable, the improvement comprising;

first and second rows of parallel and elongated vane members projecting from a first housing portion and defining first and second rows of conductor receiving channels,

said vane members having relatively thin elongated top edges merging with thickened base portions which substantially reduce the widths of said conductor receiving channels approximately to the widths of said conductors,

electrical contacts between said first and second rows of vane members and having conductor contacting portions in alignment with said reduced width conductor receiving channels,

each of said contacts having electrical lead portions externally projecting from said first housing, and

means on said thickened base portions for latchable engagement with said second housing portion,

each said contact includes first and second wire gripping jaws for gripping opposite sides of a corresponding conductor in two locations along the length thereof,

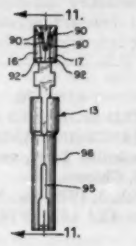
each said contacts includes first and second plates connected by a web, the outside corner edges of said plates being coined, and the inside corner edges projecting diagonally inward toward each other and defining said first and second pairs of wire gripping jaws for slicing engagement on opposite sides of a conductor inserted between said plates and between pairs of said inside corner edges.

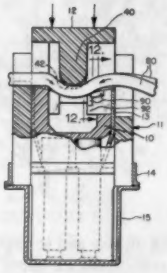
4,160,574

CONNECTOR FOR FLAT WIRE CABLES HAVING IMPROVED CONTACTS AND INTEGRAL STRAIN RELIEF MEANS

Robert W. DeRoss, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 786,342, Apr. 11, 1977, abandoned. This application Nov. 29, 1977, Ser. No. 855,636
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **30 Claims**





1. A connector for making intimate electrical contact with an insulated conductor having a longitudinal axis comprising:

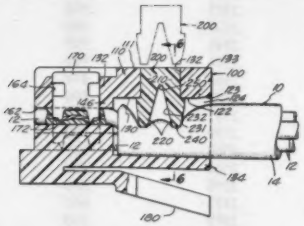
contact means including at least one contact element, each said contact element including a pair of oppositely disposed members for piercing and stripping a longitudinal portion of the insulation from opposite sides of said conductor, each said longitudinal portion having a broad longitudinal surface area relative to the diameter of said conductor, and a conductor contact portion extending substantially parallel to the axis of said longitudinal portions when said conductor is engaged therewith, each said piercing and stripping member of each said contact element including first and second elongate component portions longitudinally aligned at an angle relative to each other, each said component portion having elongate cutting means defined by beveled surface means; and

means for moving said insulated conductor into successive engagement with said piercing and stripping members and said contact portion of said contact element for first piercing and continuously stripping the insulation along said opposing longitudinal portions of said conductor and for thereafter positioning said longitudinal conductor portions adjacent said contact portion, said contact portion being adapted to exert a force against said longitudinal conductor portions in a direction normal to the conductor to effect a broad intimate flat surface contact therewith.

4,160,575
TELEPHONE CORD CONNECTOR

Eugene H. Schraut, Covina, Calif., assignor to Vari-Tronics Co., Duarte, Calif.

Filed Feb. 24, 1978, Ser. No. 880,889
Int. Cl.[2] H01R 13/58
U.S. Cl. 339—103 M 20 Claims



1. In a modular connector for making electrical connections with a cord composed of a plurality of mutually-insulated conductors encased within a plastic insulating jacket and with another component external to the connector, which connector includes an insulating housing that has a cord-receiving cavity with an aperture at the cord end thereof and a plurality of conductor-receiving cells at the terminal end thereof and passages providing communication from said cavity to said cells and terminal receiving openings in association with the cells, whereby, when such a cord is inserted longitudinally into said cavity from said cord end, exposed ends of said conductors extend longitudinally through said apertures from said cavity toward said terminal end into said cells, and terminals may extend into said cells through said openings into electrical communication with said exposed ends,

the improvement wherein said housing has a lateral opening through a side wall thereof in communication with said cavity and has an edge at said opening that extends transversely of said housing,

said improvement also including

a separate anchoring member that extends from said lateral opening into said cavity and which comprises a projecting part for engaging said edge to clamp said anchoring member against outward escape through said lateral opening,

said anchoring member also comprising at least two spaced cross members that extend transversely of said housing on the cavity side thereof to compress said jacket to fit tightly against the wall of said cavity opposite said lateral opening and with a portion of said jacket captivated between said spaced cross members,

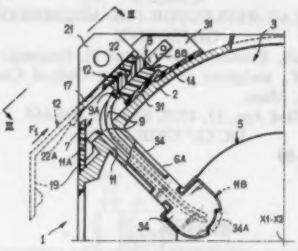
whereby said cord is restrained both against being pulled longitudinally out of said housing and against axial rotation within said housing.

4,160,576
ELECTRIC POWER SUPPLY CONNECTOR ESPECIALLY FOR A FAN OF THE FLAT TYPE

Claude Vettori, Neauphle le Chateau, France, assignor to Etudes Techniques et Representations Industrielles E.T.R.I., Neuilly-sur-Seine, France

Filed Mar. 23, 1978, Ser. No. 889,211
Claims priority, application France, Apr. 13, 1977, 77 11096
Int. Cl.[2] H01R 13/42
U.S. Cl. 339—119 R 9 Claims

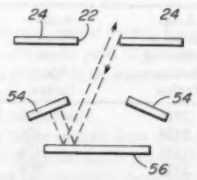
1. An electric power supply connector, especially for a fan of the flat type comprising a hollow housing and a cylindrical shell defining an axial duct for an impeller, said impeller being driven by an electric motor which is secured to the cylindrical shell by means of substantially radial arms, the connector being mounted externally on the cylindrical shell and constituted by a cavity for receiving at least one anchoring block provided with retaining means for an internal portion of each connector terminal which is connected to the motor by means of a conductor placed within a channel of one of the radial arms, the connector terminal being constituted by a projecting external portion which can be connected to an electric power supply, a cover-plate being provided for covering the cavity in the service position as well as maintaining the anchoring block and the end portion of each associated conductor in said position, wherein the anchoring block is made up of two complementary portions which can be interassembled in the service position in order to constitute a housing for retaining the internal portion of each connector terminal, at least one of the complementary portions of the anchoring block being provided with projecting claws which can be engaged and locked on bosses for retaining the other portion in the aforementioned service position.



4,160,577
HEAT RECUPERATOR

Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corporation, Buckfield, Me.

Continuation-in-part of Ser. No. 663,370, Mar. 3, 1976, Pat. No. 4,082,414, and Ser. No. 773,687, Mar. 2, 1977, abandoned. This application Oct. 11, 1977, Ser. No. 840,632
Int. Cl.[2] G02B 5/124
U.S. Cl. 350—1.1 18 Claims



1. A heat recuperator for returning an incident beam of radiative energy to its source, said beam incident from any direction within a predetermined solid angle, said recuperator comprising a main array of radiant heat reflecting cells each comprising a substrate defining at least three planar surfaces intersecting each other in angles of approximately 90°, each said planar surface being in the form of a geometric figure having at least four edges, front substrate surfaces facing said solid angle being reflective of a major fraction of incident electromagnetic radiation in the wavelength band of about 1 micron to about 20 microns said incident beam of radiation having direction cosines (a,b,c) in the coordinate system oriented with the intersections of said planar surfaces, the recuperator further including at least one secondary array of said reflecting cells, said secondary array positioned with respect to said main array at a direction defined by a set of direction cosines chosen from the following group:

−a,	b,	c;
−a,	−b,	c;
a,	−b,	c;

-continued

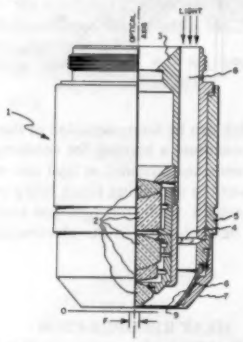
a,	−b,	−c;
a,	b,	−c;
−a,	b,	−c.

4,160,578

ANNULAR REFLECTOR FOR MICROSCOPE OBJECTIVE

Nathan Gottlieb, Kenmore, and Milton H. Sussman, Amherst, both of N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 17, 1978, Ser. No. 896,969
Int. Cl.[2] G02B *21/10*
U.S. Cl. 350—89 4 Claims



1. In a dark-field, vertically-illuminated microscope objective having an effective power of 6.5×, a numerical aperture of 0.15, and a working distance of 18.35 mm the improvement comprising an annular reflector for providing substantially uniform object illumination having the following parameters.

Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches	Axial Distance from Object Inches	Axial Radius to Reflecting Surface inches
.420	.2320	.472	.2419
.422	.2324	.474	.2423
.424	.2328	.476	.2426
.426	.2332	.478	.2430
.428	.2336	.480	.2434
.430	.2339	.482	.2438
.432	.2343	.484	.2441
.434	.2347	.486	.2445
.436	.2351	.488	.2449
.438	.2355	.490	.2453
.440	.2359	.492	.2456
.442	.2362	.494	.2460
.444	.2366	.496	.2464
.446	.2370	.498	.2467
.448	.2374	.500	.2471
.450	.2378	.502	.2475
.452	.2381	.504	.2478
.454	.2385	.506	.2482
.456	.2389	.508	.2486
.458	.2393	.510	.2490
.460	.2396	.512	.2493
.462	.2400	.514	.2497
.464	.2404	.516	.2501
.466	.2408	.518	.2504
.468	.2411	.520	.2508
.470	.2415	.522	.2512
.524	.2515	.576	.2609
.526	.2519	.578	.2613
.528	.2523	.580	.2617
.530	.2526	.582	.2620

-continued

Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches	Axial Distance from Object Inches	Axial Radius to Reflecting Surface inches
.532	.2530	.584	.2624
.534	.2533	.586	.2627
.536	.2537	.588	.2631
.538	.2541	.590	.2635
.540	.2544	.592	.2638
.542	.2548	.594	.2642
.544	.2552	.596	.2645
.546	.2555	.598	.2649
.548	.2559	.600	.2652
.550	.2563	.602	.2656
.552	.2566	.604	.2660
.554	.2570	.606	.2663
.556	.2573	.608	.2667
.558	.2577	.610	.2670
.560	.2581	.612	.2674
.562	.2584	.614	.2677
.564	.2588	.616	.2681
.566	.2591	.618	.2685
.568	.2595	.620	.2688
.570	.2599	.622	.2692
.572	.2602	.624	.2695
.574	.2606	.626	.2699
.628	.2702	.680	.2794
.630	.2706	.682	.2798
.632	.2709	.684	.2801
.634	.2713	.686	.2805
.636	.2716	.688	.2808
.638	.2720	.690	.2812
.640	.2724	.692	.2815
.642	.2727	.694	.2819
.644	.2731	.696	.2822
.646	.2734	.698	.2826
.648	.2738	.700	.2829
.650	.2741	.702	.2833
.652	.2745	.704	.2836
.654	.2748	.706	.2840
.656	.2752	.708	.2843
.658	.2755	.710	.2847
.660	.2759	.712	.2851
.662	.2762	.714	.2854
.664	.2766	.716	.2858
.666	.2769	.718	.2861
.668	.2773	.720	.2865
.670	.2776	.722	.2868
.672	.2780	.724	.2872
.674	.2784	.726	.2875
.676	.2787	.728	.2879
.678	.2791	.730	.2882
.732	.2886	.784	.2981
.734	.2889	.786	.2985
.736	.2893	.788	.2988
.738	.2897	.790	.2992
.740	.2900	.792	.2996
.742	.2904	.794	.3000
.744	.2907	.796	.3004
.746	.2911	.798	.3008
.748	.2914	.800	.3011
.750	.2918	.802	.3015
.752	.2922	.804	.3019
.754	.2925	.806	.3023
.756	.2929	.808	.3027
.758	.2932	.810	.3031
.760	.2936	.812	.3035
.762	.2940	.814	.3038
.764	.2943	.816	.3042
.766	.2947	.818	.3046
.768	.2951	.820	.3050
.770	.2954	.822	.3054
.772	.2958	.824	.3058
.774	.2962	.826	.3062
.776	.2966	.828	.3066
.778	.2969	.830	.3069
.780	.2973	.832	.3073
.782	.2977	.834	.3077
.836	.3081	.888	.3182

-continued

Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches	Axial Distance from Object Inches	Axial Radius to Reflecting Surface inches
.838	.3085	.890	.3186
.840	.3089	.892	.3190
.842	.3093	.894	.3193
.844	.3097	.896	.3197
.846	.3100	.898	.3201
.848	.3104	.900	.3205
.850	.3108	.902	.3209
.852	.3112	.904	.3213
.854	.3116	.906	.3217
.856	.3120	.908	.3220
.858	.3124	.910	.3224
.860	.3128	.912	.3228
.862	.3131	.914	.3232
.864	.3135	.916	.3236
.866	.3139	.918	.3240
.868	.3143	.920	.3244
.870	.3147	.922	.3247
.872	.3151	.924	.3251
.874	.3155	.926	.3255
.876	.3159	.928	.3259
.878	.3162	.930	.3263
.880	.3166	.932	.3267
.882	.3170	.934	.3270
.884	.3174	.936	.3274
.886	.3178	.938	.3278
.940	.3282	.992	.3381
.942	.3286	.994	.3385
.944	.3290	.996	.3389
.946	.3293	.998	.3393
.948	.3297	1.000	.3396
.950	.3301	1.002	.3400
.952	.3305	1.004	.3404
.954	.3309	1.006	.3408
.959	.3313	1.008	.3411
.958	.3316	1.010	.3415
.960	.3320	1.012	.3419
.962	.3324	1.014	.3423
.964	.3328	1.016	.3427
.966	.3332	1.018	.3430
.968	.3336	1.020	.3434
.970	.3339	1.022	.3438
.972	.3343	1.024	.3442
.974	.3347	1.026	.3445
.976	.3351	1.028	.3449
.978	.3355	1.030	.3453
.980	.3358	1.032	.3457
.982	.3362	1.034	.3461
.984	.3366	1.036	.3464
.986	.3370	1.038	.3468
.988	.3374	1.040	.3472
.990	.3377	1.042	.3476
1.044	.3479	1.096	.3576
1.046	.3483	1.098	.3580
1.048	.3487		
1.050	.3491		
1.052	.3494		
1.054	.3498		
1.056	.3502		
1.058	.3506		
1.060	.3509		
1.062	.3513		
1.064	.3517		
1.066	.3521		
1.068	.3524		
1.070	.3528		
1.072	.3532		
1.074	.3535		
1.076	.3539		
1.078	.3543		
1.080	.3547		
1.082	.3550		
1.084	.3554		
1.086	.3558		
1.088	.3561		
1.090	.3565		

-continued

Axial Distance from Object Inches	Axial Radius to Reflecting Surface Inches	Axial Distance from Object Inches	Axial Radius to Reflecting Surface inches
1.092	.3569		
1.094	.3573		

4,160,579

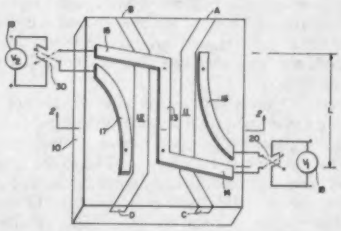
TAPERED VELOCITY ELECTRO-OPTICAL WAVEGUIDE SWITCH

A. Fenner Milton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1978, Ser. No. 896,075

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.14 **3 Claims**



1. A four part electro-optical switch for selectively switching radiation from one light path to another comprising:

a substrate of an electro-optic material;

a first optical waveguide;

a second optical waveguide;

said waveguides being spaced from each other and paralleling each other along the major portion of their length with the ends of said waveguides diverging from each other;

at least one pair of curved electrodes with one electrode disposed on said substrate along the outer surface of each of said waveguides with one end adjacent a divergent end with the opposite end of each of said electrodes curved away from its adjacent waveguide;

an electrode disposed on said substrate equidistant between said waveguides, said electrode including a first and second end;

means for connecting a first voltage source to said first end of said third electrode and to the end of one of said curved electrodes which end is curved away from said waveguide, adjacent to said curved electrode;

means for connecting a second voltage source to the second end of said third electrode and to the end of the other electrode of said pair of electrodes which end is curved away from is adjacent waveguide,

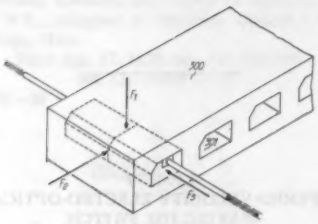
whereby in the "on " state the voltage of said first and second sources is applied so that the difference in propagation constant between said waveguide channels varies slowly over their length changing sign in the mid-point of their length thereby switching optical radiation from one waveguide to the other.

4,160,580

DEVICE FOR TERMINATING THE FIBERS OF AN OPTICAL FIBER RIBBON WITH CONNECTORS

Georges E. Le Noane, Kerrougant Bras, Tregastel, and André M. Mathern, Rte. du Rusquet Brelévenez, Lannion, both of France

Filed Jun. 15, 1978, Ser. No. 915,660
Claims priority, application France, Jun. 17, 1977, 77 18675
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 6 Claims



1. A device for providing the end portions of the fibers of a flat optical fiber ribbon with connectors comprising:

at least an elongated substantially parallelepipedal connector made of rigid material having two adjacent inner surfaces forming a re-entrant right connector dihedron and two adjacent outer surfaces forming a projecting right connector dihedron and a third surface formed with at least a longitudinal groove, said groove being relatively wide and deep so that a sheathed fiber can be inserted therein with clearance;

a template having a first and a second adjacent surfaces forming a re-entrant right template dihedron, said surfaces intersecting along a template reference direction;

at least two transverse members secured to the first surface of said template dihedron and perpendicular to the second surface thereof, said transverse members having upper surfaces lying in one and the same plane parallel to said first template dihedron surface, being spaced apart by a length exactly equal to that of an elongated connector and defining a connector recess;

a first groove formed in one of said at least two transverse members receiving the sheathed part of the end portion of said optical fiber and a second groove aligned with said first groove and formed in the second of said at least two transverse members receiving the stripped part of the end portion of said optical fiber, the optical fiber guided in said grooves being parallel to said template reference direction;

means for inserting an elongated connector into said connector recess with the projecting connector dihedron accomodating the re-entrant template dihedron, the optical fiber being guided, when passing in the longitudinal connector groove, through aligned first and second grooves on each side of said connector, whereby it can be bonded to said connector in predefined position.

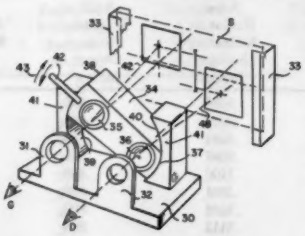
4,160,581

POSITIONING SYSTEM OF THE OPTICAL AXES OF AN OBSERVATION DEVICE FOR COUPLED IMAGES, AND THE OBSERVATION DEVICE FOR SUCH A SYSTEM

Alain Weissler, Boussy-Saint Antoine, France, assignor to Louis Peretz, La Celle Saint-Cloud, France

Filed Sep. 9, 1977, Ser. No. 831,912
Int. Cl.[2] G02B *27/22*
U.S. Cl. 350—133 8 Claims

1. A device for viewing two coupled images simultaneously comprising a stand, two convergent optical units connected side by side in said stand, said units being mounted in a single block with their parallel optical axes in front of said coupled images to provide enlarged images for observation and means for rotating both of said units with respect to said stand, each



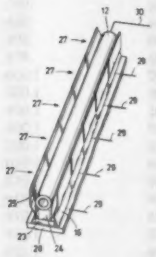
of said units having lateral, cylindrical surfaces with axes parallel to said optical axes for adjusting that unit.

4,160,582

ELECTROSTATIC DISPLAY ASSEMBLY

Sasaki Yasuo, Kobe, Japan, assignor to Displaytek Corporation and Daiwa Shinku Corporation, both of, Japan

Filed Mar. 28, 1978, Ser. No. 891,114
Claims priority, application Japan, Apr. 1, 1977, 52-41448[U]
Int. Cl.[2] G02F *1/00*
U.S. Cl. 350—269 3 Claims



1. An electrostatic display assembly comprising:

a base of insulating material;

a plurality of channel shaped casings fixed to the base into a line, each casing having a pair of side walls opposite to each other;

a pair of supporting plates laid one on the other within each casing;

a fixed electrode with a cylindrical surface extending throughout the length of the plurality of casings within the same;

a resilient sheet electrode interposed between the supporting plates in each casing so that each side of the resilient sheet electrode is upturned and extends upwards adjacent to the fixed electrode along the inner surface of the side wall of the casing;

a layer of insulating material disposed between the fixed electrode and the resilient sheet electrodes; and

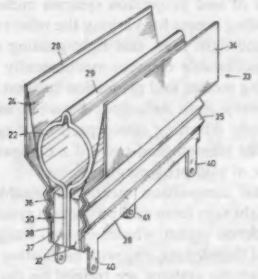
a means for applying a voltage between the fixed electrode and each of the resilient sheet electrodes which are electrically independent of each other, the outer surface of the fixed electrode and the inner surfaces of the resilient sheet electrodes being different in appearance from each other, whereby upon the application of a voltage between the fixed electrode and at least one of the resilient sheet electrodes independently of the others, the at least one of the resilient sheet electrodes are attracted to the surface of the fixed electrode and cover the same, causing a distinct change in the appearance of the assembly.

4,160,583

ELECTROSTATIC DISPLAY DEVICE

Hirotada Ueda, Kobe, Japan, assignor to Displaytek Corporation and Daiwa Shinku Corporation, both of, Japan

Filed Mar. 28, 1978, Ser. No. 891,115
Claims priority, application Japan, Apr. 1, 1977, 52/41452[U]; Oct. 8, 1977, 52/135345[U]
Int. Cl.[2] G02F *1/00*
U.S. Cl. 350—269 4 Claims



1. An electrostatic display device comprising:
a casing having at least one side wall;
a fixed electrode having a cylindrical surface;
at least one resilient sheet electrode supported by a pair of supporting panels opposite to each other, each of the panels having at least one lateral projection on the inner surface thereof, the panels being disposed in such a manner that the projection on one of the panels is alternate to that of the other, so that the resilient sheet electrode is forced into contact with at least one projection on each panel;
a layer of insulating material disposed between the electrodes; and
means for applying electrical power to the fixed and resilient electrodes, whereby upon the application of voltage to the electrodes, the resilient sheet electrode is attracted to the cylindrical surface of the fixed electrode and covers the same, changing the appearance of the device.

3. An electrostatic display device comprising:
a casing having at least one side wall;
a fixed electrode having a cylindrical surface and an axial ridge at the uppermost portion of the cylindrical surface;
at least one resilient sheet electrode standing adjacent to the fixed electrode along the inner surface of the side wall;
a layer of insulating material disposed between the electrodes; and
means for applying a voltage between the fixed electrode and the resilient sheet electrode, whereby upon the application of voltage between the electrodes, the resilient sheet electrode is attracted to the cylindrical surface of the fixed electrode and covers the same, changing the appearance of the device.

4,160,584

TRANSPARENT METALLIC COATING AND A GLASS OVERCOATING ON A PLASTIC SUBSTRATE PRODUCE A CHROMATIC EFFECT

Charles L. Giles, Wilmington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 686,787, May 17, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,481
Int. Cl.[2] G02C *7/12*; G02B *1/10, 1/24*
U.S. Cl. 351—49 7 Claims

1. A spectacle lens for spectacles comprising a pair of lens rims connected by a bridge portion for supporting right and left spectacle lenses, each of said rims retaining a spectacle lens, said spectacle lens comprising in order:
(a) a transparent light polarizer substrate;
(b) a transparent continuous layer of a metal coated on one surface of said substrate; and
(c) a transparent continuous layer of a dielectric material coated over said metallic layer, the dielectric material

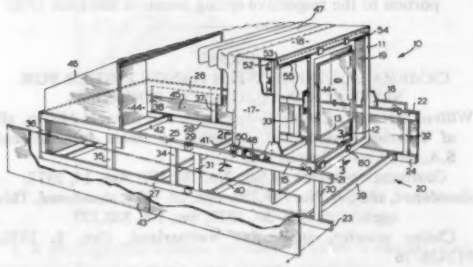
being an odd multiple of one-quarter wavelength in thickness with respect to a reference color of the spectrum, said layer of dielectric material being positioned on the side of said lens opposed to the eye of the wearer.

4,160,585

SPECIAL EFFECTS DEVICE

Warren Keillor, 201-3 Centre St., Markham, Ontario, Canada (L3P 3P9)

Filed Sep. 19, 1977, Ser. No. 834,434
Int. Cl.[2] G03B *21/32*
U.S. Cl. 352—87 11 Claims



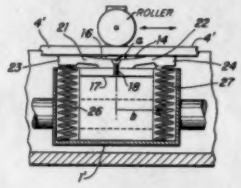
1. A special effects device for use in motion pictures, television and the like comprising of an outer frame, a middle frame and an inner frame; said middle frame mounted on said outer frame in a manner for translational movement relative to said outer frame and said inner frame mounted on said middle frame in a manner for translational movement relative to said middle frame; means for imparting translational movement to said middle frame; means for imparting translational movement to said inner frame; means for coordinating said transational movements; means for supporting an object within the perimeter of said inner frame; the arrangement of said frames being such that by coordinating the movements of said inner and middle frames translational movement is imparted to said object; said outer frame is mounted on a stand for movement in a direction perpendicular to the plane of movement of said middle and inner frames and means for imparting such movement to said outer frame.

4,160,586

BACKLASHLESS PHOTOTYPESETTER CARRIAGE BRAKE

Peter R. Ebner, South Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Dec. 27, 1977, Ser. No. 864,308
Int. Cl.[2] B41B *13/00*
U.S. Cl. 354—5 **4 Claims**



1. In a phototypesetter having a movable lens carriage, a backlashless carriage brake for applying a constant force in opposition to the bilateral motion of said carriage comprising:

a. an elongated way member positioned along the path of motion of said carriage;

b. a brake shoe member having a central portion rigidly affixed to said movable carriage and having a first bowed flexible arm member having an outer portion thereof together with a second bowed flexible arm member having an outer portion thereof;

c. first spring means separate from said flexible arm member for urging the outer portion of said first flexible arm member against said way member;

d. second spring means separate from said flexible arm member for urging the outer portion of said second flexible arm member against said way member; and

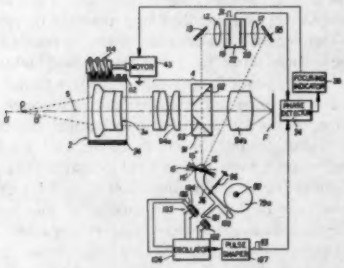
e. said brake shoe member having a shallow configuration, i.e., the ratio of the perpendicular distance from said rigidly fixed central portion to the elongated way to the perpendicular distance from said rigidly fixed central portion to the respective spring means is less than 1/10.

4,160,587

CAMERA EQUIPPED WITH RANGE FINDER FOR MANUAL OR AUTOMATIC FOCUSING

Wilfred Heiniger; Claude Kreienbuehl, and Manuel Millan, all of Yverdon, Switzerland, assignors to Bolex International S.A., Ste-Croix, Switzerland

Continuation-in-part of Ser. No. 787,497, Apr. 14, 1977, abandoned, and Ser. No. 789,250, Apr. 20, 1977, abandoned. This application Sep. 30, 1977, Ser. No. 838,377
Claims priority, application Switzerland, Oct. 1, 1976, 012428/76
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—25 **23 Claims**



1. In a camera having an objective provided with setting means for varying the position of an axially shiftable lens member thereof to focus the objective upon an object along its axis, said objective further having components between which the incident light rays from an object have predetermined orientations in a position of said shiftable lens member in which the objective is focused upon such object,

the combination therewith of:

a pair of ancillary projection systems intercepting incident light rays from an object in line with said objective, at least one of said projection systems including adjustable light-guiding means for varying the relative position of the intercepted light rays, said light-guiding means comprising an oscillatable element mechanically independent of said setting means, said projection systems including a pair of stationary light reflectors between said components respectively directing intercepted light rays toward said oscillatable element and toward a companion element in the other of said projection systems;

photoelectric comparison means illuminable by the intercepted light rays from said projection systems for emitting a coincidence signal whenever two images respectively produced thereby register with each other to indicate that said projection systems are trained on the same object;

sensing means responsive to the positions of said setting means and of said element for generating a correlation signal upon detecting an agreement between said positions;

scanning means coupled with said element for periodically displacing same in a succession of sweeps whereby said correlation and coincidence signals appear in the form of short pulses during each sweep; and

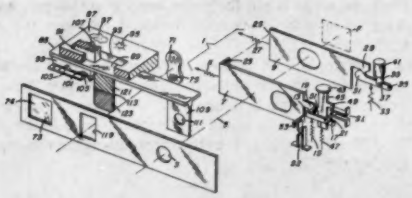
phase-detecting means connected to said comparison means and to said sensing means for determining the relative time position of said pulses.

4,160,588

EXPOSURE CONTROL APPARATUS

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,775
Int. Cl.[2] G03B *7/00*
U.S. Cl. 354—31 **8 Claims**



1. In an exposure control apparatus for a photographic camera, the combination comprising:

means for selecting any one of a plurality of various size exposure apertures;

means for providing a plurality of exposure times;

a signal emitting source for producing a signal to indicate that the level of light received from a scene to be photographed is too low for a proper film exposure at the selected aperture; and

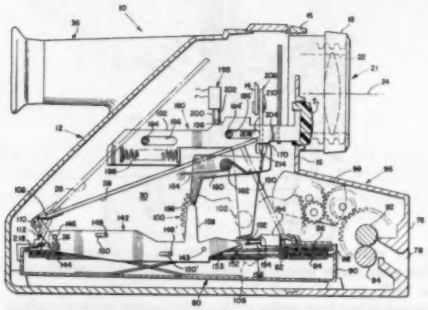
means operatively associated with said aperture selecting means and said exposure time providing means for changing the level of scene light and the exposure time at which said low light signal is produced in accordance with a change of the selected aperture.

4,160,589

COMBINED SOLENOID AND TIMING SYSTEM FOR SLR CAMERA APPARATUS

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1978, Ser. No. 883,186
Int. Cl.[2] G03B *17/50*
U.S. Cl. 354—86 14 Claims



1. A photographic camera having means for mounting photographic film material of the self-developing type at a given focal plane and for receiving a source of electrical energy, said camera comprising:

a manually actuable member mounted for reciprocal movement between an initial position and a second position;

a shutter blade mechanism;

means for mounting said shutter blade mechanism for displacement between an initial scene light unblocking arrangement and a scene light blocking arrangement;

selectively actuable drive means for displacing said shutter blade mechanism between its said scene light blocking and unblocking arrangements, said drive means including an electrically energizable component for displacing said shutter blade mechanism towards its said scene light blocking arrangement and a resilient biasing element for yieldably urging said shutter blade mechanism towards its said initial scene light unblocking arrangement;

a mirror assembly;

means for mounting said mirror assembly for displacement between an initial position wherein it precludes scene light passing through said shutter blade mechanism from impinging upon the focal plane and another position wherein it redirects scene light passing through said shutter blade mechanism towards the focal plane;

spring means for urging said mirror assembly from its said initial position towards it said other position;

a film processing and advancing roller;

a motor;

an energizable scene light detecting and integrating device;

a normally non-conducting first switch coupled to the source of electrical energy and arranged to be rendered conductive when said manually actuable member is displaced from its initial position to its said second position and again non-conductive when said manually actuable member is returned to its said initial position;

a normally non-conductive second switch coupled between the source of electrical energy and said motor;

means for rendering said second switch conductive and for sequentially utilizing said energized motor to drive said roller and thus effect the return of said mirror assembly to its said initial position when said manually actuable member is returned to its said initial position and said mirror assembly is in its said other position and for rendering said second switch again non-conductive when said mirror assembly is subsequently returned to its said initial position;

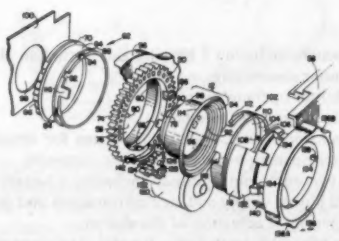
means responsive to rendering said first switch conductive for actuating said drive means to effect the displacement of said shutter blade mechanism into its said light blocking arrangement under the influence of said energizable component, for then effecting the displacement of said mirror assembly into its said scene light redirecting position under the influence of said spring means, for then actuating said drive means to effect the displacement of said shutter blade mechanism to its said scene light unblocking arrangement under the influence of said resilient urging element and for energizing said scene light detecting and integrating device, for then actuating said drive means to return said shutter blade mechanism back to its said scene light blocking arrangement under the influence of its said energizable component when said scene light detecting and integrating device has determined that the proper amount of scene light has impinged upon a film unit disposed at the focal plane, for then effecting the return of said manually actuable member to its said initial position whereby said first switch is rendered non-conductive and said second switch is rendered conductive to energize said motor to sequentially drive said film processing and advancing roller and effect the return of said mirror assembly to its said initial position thus rendering said second switch non-conductive and for then actuating said drive means to effect the return of said shutter blade mechanism to its said initial scene light unblocking arrangement.

4,160,590

REMOVABLE (LENS POSITION LIMITING) STOP FOR AUTO-MANUAL FOCUSING CAMERAS

John M. Reynard, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 17, 1978, Ser. No. 896,713
Int. Cl.[2] G03B *3/00*
U.S. Cl. 354—195 21 Claims



1. A photographic camera operative in either a manual or an automatic focusing mode, said camera comprising:

means for defining an image plane;

means for directing scene light along a given optical path to said image plane, said directing means including a lens assembly having a lens mounted for displacement over a focusing range wherein various positions thereof respectively serve to focus an image at said image plane of subjects positioned in various locations within a predetermined range of subject distances, and for further displacement from its said focusing range into a second range wherein it does not serve to focus images at said image plane of subjects positioned within said predetermined subject distance range;

means for selectively coupling said camera to a source of electrical energy;

ranging and focusing means for producing a signal indicative of the position of a particular subject selected to be photographed and for effecting movement of said lens from its said second range to a position in said focusing range in

accordance to said signal where said lens serves to focus an image of said particular subject at said image plane;

means for unblocking and blocking said optical path to produce an exposure interval; and

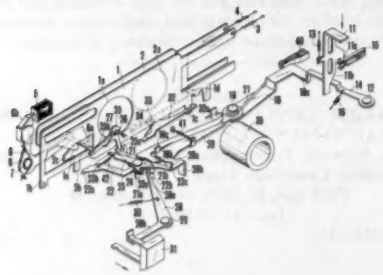
manually actuatable means for selecting the manual focusing mode of said camera, said manually actuatable means including means for limiting the manual displacement of said lens to within its said focusing range when said manual focusing mode is selected.

4,160,591

CAMERA HAVING AN ELECTRICALLY TIMED SHUTTER

Toyotoshi Suzuki, Tokyo, and Kazunari Matsuzaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1978, Ser. No. 877,747
Claims priority, application Japan, Feb. 23, 1977, 52/18966
Int. Cl.[2] G03B *9/08, 9/40*
U.S. Cl. 354—235 **2 Claims**



1. A camera including a housing and having an electrically timed shutter comprising:

(a) a shutter opening member;

(b) a shutter closing member;

(c) mechanical release actuating means for actuating said shutter opening member to initiate exposure;

(d) an exposure control circuit including a battery for electrical power supply and an electromagnet and controlling the period of actuation of the shutter;

(e) first releasable latch means for said closing member movable, in response to the energized state of said electromagnet, between a position where said shutter closing member is latched and a position where said shutter closing member is released;

(f) means causing said first latch means to be displaced to a position where said shutter opening member is locked in response to operation of said actuating means when said electromagnet is not supplied with sufficient electrical energy;

(g) a battery chamber and a cover detachable from said chamber in said housing;

(h) changeover means responsive to the detachment of the cover for releasing said shutter opening member from the locked position;

(i) a second releasable latch means for latching said shutter closing member in response to said changeover means; and

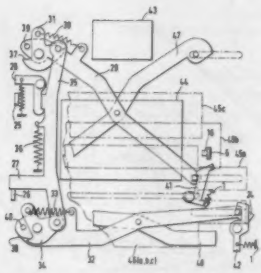
(j) means arranged upon movement of said shutter opening member to be displaced so that said closing member is released from said second latch means.

4,160,592

CAMERAS

Rolf Noack, and Karl Kromer, both of Dresden, German Democratic Rep., assignors to Veb Pentacon Dresden Kamera und Kinowerke, Dresden, German Democratic Rep.

Filed Sep. 8, 1977, Ser. No. 831,652
Claims priority, application German Democratic Rep., Sep. 24, 1976, 194968
Int. Cl.[2] G03B *9/40, 19/12*
U.S. Cl. 354—246 **3 Claims**



1. A lamellar focal-plane shutter for monocular mirror reflex cameras having a swivelling viewfinder mirror and shutter blades which return automatically to their starting positions after each exposure operation, comprising

(a) a first rotatably mounted tensioning plate,

(b) a shutter opening lever,

(c) an opening spring connected between said first tensioning plate and said shutter opening lever,

(d) a second rotatably mounted tensioning plate,

(e) a shutter closing lever,

(f) a closing spring connected between said second tensioning plate and said closing lever,

(g) a coupling rod connected between said first and second tensioning plates,

(h) a spring attached to said rod for tensioning upon the cocking of the camera,

(i) a detent lever for holding the rod in a tensioned position and

(j) a release arm for actuating said detent lever for the release of the coupling rod, said release arm returning to the start position when the viewfinder mirror returns to its viewing position.

4,160,593

APPARATUS FOR DEVELOPING LATENT IMAGES

Norman J. Rosenburgh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 763,443, Jan. 28, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,970
Int. Cl.[2] G03D *5/00;* **G03G** *15/10*
U.S. Cl. 354—317 **23 Claims**

1. Apparatus for developing a latent image on an image-bearing support, said apparatus comprising:

(a) a housing which defines a chamber, said housing having means defining an opening therein against which the image-bearing support can be positioned for communication with the chamber;

(b) first conduit means connectable to a source of development liquid under pressure;

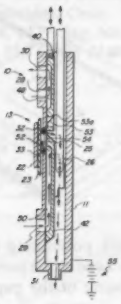
(c) second conduit means connectable to a source of drying gas under pressure;

(d) valve means having a first operational state placing said chamber in fluid communication with said first conduit and a second operational state placing said chamber in fluid communication with said second conduit;

(e) a member having a surface which is movable along a path between (1) a developing position proximate said opening

to form, with a positioned image-bearing support, a flow passage for development liquid and (2) a retracted position out of fluid communication with said chamber; and

(f) control means for coordinating the operation of said



valve means with the movement of said surface so that said surface is in its developing position when said valve means is in its first operational state, and so that said surface is in its retracted position when said valve means is in its second operational state.

4,160,594

METHOD AND ARRANGEMENT FOR THE DEVELOPMENT OF LATENT IMAGES PARTICULARLY LATENT PHOTOGRAPHIC IMAGES

Erwin Geyken, and Peter Dawidowitsch, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

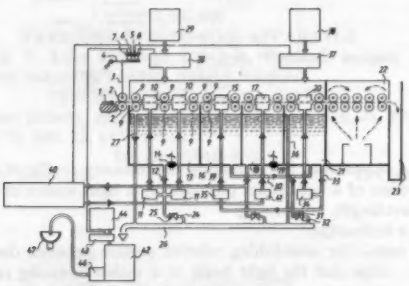
Continuation of Ser. No. 530,049, Dec. 5, 1974, Pat. No. 4,081,816. This application Sep. 22, 1977, Ser. No. 835,527

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1973, 2361151

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.[2] G03D *3/02*

U.S. Cl. 354—324 **9 Claims**



1. In an apparatus for the development of photographic film, in combination,

transport means for transporting photographic film along a predetermined transport path;

a developing station provided with means for applying developer fluid to photographic film at a predetermined location along said path;

a fixing station provided with means for applying fixer fluid to photographic film at a location along said path downstream of said developing station;

a waste line for receiving and sewering spent photographic film-processing fluids;

means operative during operation of the apparatus for continually supplying fresh developer fluid to said developing station and continually withdrawing spent developer fluid from said developing station and transmitting the withdrawn spent developer fluid to said waste line along a predetermined developer-fluid withdrawal path;

fixer-fluid desilvering means operative for removing silver from spent fixer fluid;

means operative during operation of the apparatus for continually withdrawing spent fixer fluid from said fixing station and transmitting the withdrawn spent fixer fluid to said fixer-fluid desilvering means;

neutralizing means operative during operation of the apparatus for chemically neutralizing the withdrawn spent developer fluid separate from the withdrawn spent fixer fluid and before the withdrawn spent developer fluid reaches said waste line by continually adding a chemical oxidizing agent to the withdrawn spent developer fluid at a location along said developer-fluid withdrawal path at which withdrawn spent developer fluid is separate from and unmixed with withdrawn spent fixer fluid; and

intermediate-washing means operative for subjecting film transported from said developing station to said fixing station to an intermediate washing to thoroughly remove from the film any developer fluid clinging thereto, whereby to prevent developer fluid from reaching said fixing station and from there finding its way into said fixer-fluid desilvering means.

4,160,595

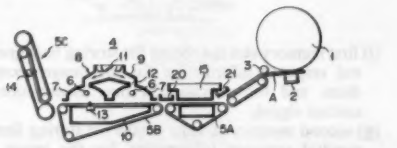
COPYING MACHINE EQUIPPED WITH A FLASH TYPE FIXING APPARATUS

Kenzo Ito, Kodaira, and Yoshiharu Abe, Tokyo, both of Japan, assignors to Copyer Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1978, Ser. No. 919,719

Int. Cl.[2] G03G *15/00*; G03B *27/76*; F27B *9/28*

U.S. Cl. 355—3 FU **8 Claims**



1. A copying machine equipped with a flash type fixing apparatus, comprising a photosensitive layer, a flash type fixing apparatus for fixing a toner powder image transferred from the photosensitive layer onto a copying paper, light shielding shutter means disposed between the fixing apparatus and the photosensitive layer, and control means for closing said light shielding shutter means during the flashing of said fixing apparatus to prevent an illumination resulting from the flashing of the fixing means from reaching the photosensitive layer.

4,160,596

DOCUMENT REPRODUCTION ILLUMINATION/EXPOSURE CONTROL SYSTEM

Robert E. Joseph, Dumfries, Va., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

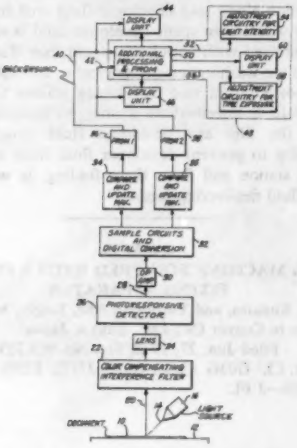
Filed Oct. 18, 1977, Ser. No. 843,293

Int. Cl.[2] G03B *27/78*

U.S. Cl. 355—68 **9 Claims**

1. A document reproduction illumination/exposure control system for ascertaining the photometric qualities of a document to be photographically reproduced on an image recording medium and providing responsive control signals for illumination and exposure parameters for a document reproduction apparatus, comprising, in combination:

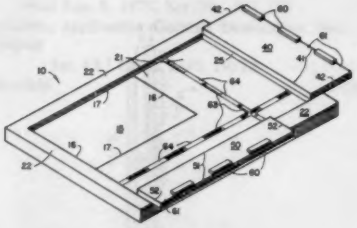
(a) variable illumination means for projecting radiation on a document to be reproduced;
(b) detecting means for receiving radiation incident from said document and generating a radiation-detected signal proportional thereto, said detecting means comprising a linear array of photoelectric elements for scanning a linear area of said document;
(c) clock signal generating means for sequentially enabling elements of said photoelectric array to scan said linear area;
(d) means for measuring radiation-detection signals for each element of said array;
(e) means for deriving from said measured radiation-detection signals first extremum signals corresponding to a background light intensity value of said document and second extremum signals corresponding to a line density light intensity value of said document;



(f) first memory storage means for storing background/spectral response information for the image recording medium, and for providing a first illumination/exposure control signal;
(g) second memory storage means for storing line density/spectral response information for the image recording medium, and for providing a second illumination/exposure control signal;
(h) means for feeding said first extremum signals to said first memory storage means for obtaining said first illumination/exposure control signal;
(i) means for feeding said second extremum signal to said second memory storage means for obtaining said second illumination/exposure control signal; and
(j) illumination/exposure control means for receiving said first and second control signals whereby illumination and/or exposure parameters are correlated between the spectral characteristics of said document and said image recording medium.

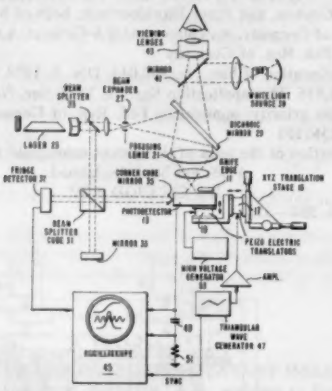
4,160,597
PHOTOGRAPHIC EASEL
Jerry S. Damm, and William R. Damm, both of 560 Sixth St., Hollister, Calif. 95023
Filed Apr. 24, 1978, Ser. No. 899,064
Int. Cl.[2] G03B *27/58*
U.S. Cl. 355—74 **4 Claims**

1. In a photographic easel having a flat panel, and a wall integral with the panel defining a side of a test paper receiving area and along which wall a test paper can be adjustably positioned to bring subdivisions thereof successively into a predetermined target area within the receiving area; a substantially rectangular spacer flap fitted against the wall; and hinge means mounting the flap on the wall for pivotal movement between a position flatly against the panel and a position retracted therefrom, said flap having an edge substantially parallel to the wall



disposed for adjustable positioning of the paper therealong when the flap is flatly against the panel and exposing said wall for adjustable positioning of the paper therealong when the flap is retracted.

4,160,598
APPARATUS FOR THE DETERMINATION OF FOCUSED SPOT SIZE AND STRUCTURE
Arthur H. Firester, Skillman, and Macy E. Heller, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Aug. 24, 1977, Ser. No. 827,254
Int. Cl.[2] G01J *1/00*
U.S. Cl. 356—121 **4 Claims**



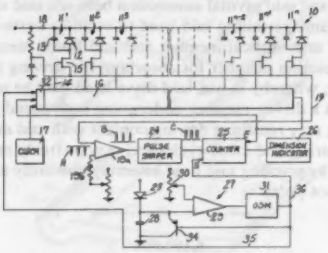
1. Apparatus, for measuring the intensity profile of a cross section of a light beam provided by a light source of known wavelength, comprising:
a knife-edge;
means for establishing relative motion between the knife-edge and the light beam in a manner causing repeated transverse scannings by the knife-edge of the light beam;
means, abutting said knife-edge, for detecting the beam light power not occluded by the knife-edge during said repeated scannings, said detecting means having a light sensitive surface and means, overlying said light sensitive surface, for effecting an alteration in the apparent optical properties of said light sensitive surface such that the apparent optical properties of said light sensitive surface substantially correspond to the optical properties of the light sensitive surface of an information record blank;
means for differentiating the output of said detecting means;
interferometer means for measuring said relative motion; and
means for simultaneously displaying the output of said dif-

ferentiating means and the output of said measuring means.

4,160,599
OPTICAL GAGING SYSTEM

Joseph L. Sperrazza, New Haven, Conn., assignor to Universal Technology, Inc., Woodbridge, Conn.

Filed Dec. 8, 1977, Ser. No. 858,822
Int. Cl.² G01B 11/06
U.S. Cl. 356—381 **6 Claims**

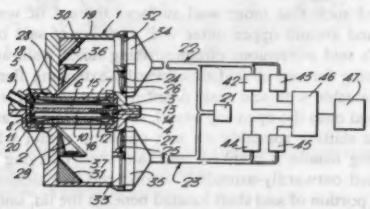


1. In an apparatus for gating the thickness of strip material comprising a linear array of back-biased photo-sensitive electrically conductive elements, means for imaging the strip across said array, each of said elements having a capacitance which may discharge through the element at a rate dependent on the light intensity incident thereon and a switch in circuit with each element for completing a circuit therethrough, means for sequentially closing and then opening said switches to recharge said capacitances in a cycle of operation, means for counting the charging pulses during a cycle of operation; separate photo-sensitive means for sensing the light from one of said strip and the background, means responsive to said separate means for generating pulses at a repetition rate proportional to the intensity of light from said one of said strip and the background, and means for utilizing said pulses to commence a cycle of operation of sequentially closing said switches, whereby the time between cycles of operation is regulated as a function of the light intensity sensed by said separate means.

4,160,600
PRESSURE-RESPONSIVE APPARATUS

Douglas V. Luke, Farnham Common, England, assignor to Smiths Industries Limited, London, England

Filed Sep. 12, 1977, Ser. No. 832,706
Claims priority, application United Kingdom, Sep. 23, 1976, 39575/76; Jun. 22, 1977, 26122/77
Int. Cl.² G01B 9/02
U.S. Cl. 356—352 **12 Claims**

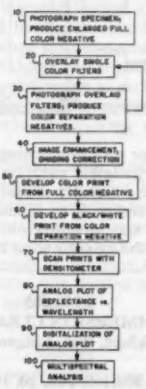


3. A temperature compensated pressure-responsive apparatus including a capsule divided into first and second cells each of which defines a first and second chamber, each of said first chambers having a curved reflective surface, each said cell including a diaphragm having a reflective surface and means mounting said diaphragm to divide the said first and second chambers of said cell from one another, said capsule having a passageway communicating with one chamber of said first cell for supply thereto of a pressure to be sensed, and said second cell being sealed whereby its interior pressure is a function of ambient temperature, a light source for providing illumination of the said first chamber of both the said first and second cells to produce first and second patterns of fringes respectively caused by interference between light reflected by each said curved reflective surface and the reflective surface of each said respective diaphragm; sensing means for sensing displacement of the said first and second patterns of fringes; and means for providing an indication of the change in pressure of said first cell with respect to said second cell in accordance with the difference between the displacement of said first and second patterns of fringes, thereby to provide an indication of the pressure being sensed, compensated for changes in temperature of the capsule.

4,160,601
BIOCONTAMINATION AND PARTICULATE DETECTION SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Jacqueline M. Jacobs, Pasadena, Calif.

Filed Feb. 24, 1978, Ser. No. 880,727
Int. Cl.² G01N 21/32; G01J 3/48
U.S. Cl. 356—404 **7 Claims**


PHOTOGRAPH SPECIMEN; PRODUCE ENLARGED FULL COLOR NEGATIVE
OVERLAY SINGLE COLOR FILTERS
PHOTOGRAPH OVERLAID FILTERS; PRODUCE COLOR SEPARATION NEGATIVES
IMAGE ENHANCEMENT; GRADING CORRECTION
DEVELOP COLOR PRINT FROM FULL COLOR NEGATIVE
DEVELOP BLACK/WHITE PRINT FROM COLOR SEPARATION NEGATIVE
SCAN PRINTS WITH DENSITOMETER
ANALOG PLOT OF REFLECTANCE vs. WAVELENGTH
DIGITALIZATION OF ANALOG PLOT
MULTISPECTRAL ANALYSIS

1. A method of determining the characterisitics of an unknown microscopic contaminant existing on a surface, comprising the steps of

photographing said surface to produce an enlarged full-color photographic negative,

overlaying said full-color negative one at a time with a plurality of individually different single-color filters, and consecutively photographing the image produced by each overlaid filter on said full color negative to create an equal number of color separation negatives,

image-enhancing said full-color negative and each of said color separation negatives to produce respectively a clarified image-enhanced full-color negative and a plurality of clarified image-enhanced color separation negatives,

developing a color print from said image-enhanced full-color negative,

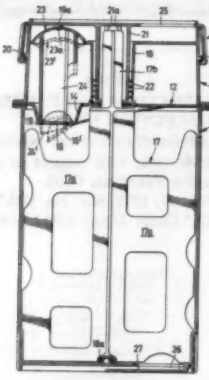
developing a single monochromatic print from each of said image-enhanced color separation negatives,

scanning said color print and each of said monochromatic prints separately to produce profiles of reflectance as a function of optical wavelength, and

comparing said reflectance profiles of contaminants with previously stored profiles of known contaminants produced in the same way, said previously stored profiles

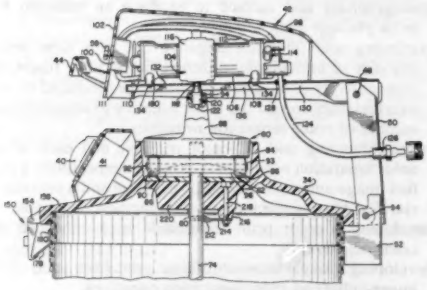
describing a known spectral signature characteristic of a known contaminant, said comparing being accomplished by matching profiles of said unknown contaminants with said stored profiles, each matching profile thus identifying an unknown microscopic contaminant.

4,160,602
MULTI-CHAMBER PACK
Maurice E. Benz, Riehen, and Peter Bähler, Seltisberg, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland
Filed Aug. 15, 1977, Ser. No. 824,666
Claims priority, application Switzerland, Aug. 18, 1976, 10513/76; Feb. 7, 1977, 1452/77
Int. Cl.[2] G05D *11/00;* **B65D** *25/08;* **B01F** *7/20*
U.S. Cl. 366—162 **16 Claims**



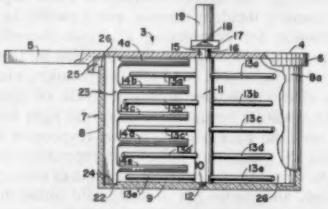
1. A multi-chamber pack comprising a first and at least one further chamber, a frangible partition separating said chambers, means operable externally of said chambers for breaking the partition within said pack, an agitator disposed rotatably in said first chamber, and mounted on said pack an actuator element coupled to the agitator so as to rotate the latter.

4,160,603
IMMERSION CLEANER
Karl G. Otzen, Brookfield, Wis., assignor to Safety-Kleen Corp., Elgin, Ill.
Division of Ser. No. 808,169, Jun. 20, 1977, Pat. No. 4,096,873. This application Jun. 26, 1978, Ser. No. 919,361
Int. Cl.[2] B08B *3/04;* **B01F** *7/32*
U.S. Cl. 366—219 **6 Claims**



1. A driving element and support assembly therefore, comprising, in combination, a clamp for encircling a liquid receiving container, a generally vertically extending head support element, including upper and lower end portions thereof, means in a part of said lower end portion pivotally attaching said lower end to a portion of said clamp, a head assembly including a frame element adapted, in a position of use, to extend generally horizontally, means for forming a pivotable connection between one end of said frame element and said upper end of said vertical member, a motor attached to said frame element, a drive shaft extending generally downwardly from said motor, a driving element disposed on said drive shaft and adapted for removable reception into a drive element receiving recess in an associated driven member, said pivotal attachment of said lower end of said vertical member to said clamp permitting said upper end of said vertical member to pivot radially inwardly and outwardly with respect to said container, and said pivotal connection between said upper end and said frame permiting said head to oscillate vertically, said clamp and said vertical member and said frame member providing a reaction member for absorbing the driving torque of said motor, whereby in use, said drive head may be associated in use with a driven member undergoing both radial and axial oscillation, may remain in driving contact with said member at all times during said drive cycles and may be freely removable therefrom by pivoting said head assembly upwardly about said second pivot point.

4,160,604
TUNA AND EGG-SALAD MIXER
Anthony DiBona, Jr., 74-16 220th St., New York, N.Y. 11364
Filed May 5, 1978, Ser. No. 903,198
Int. Cl.[2] B01F *7/20*
U.S. Cl. 366—247 **8 Claims**

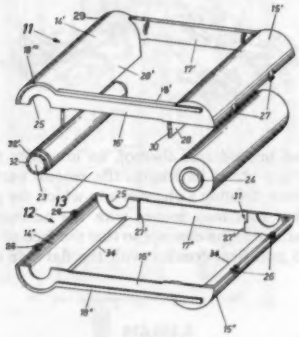


1. A salad mixing device comprising in combination: an open-top vessel having a continuous circumscribing inner wall integral with a base therefor forming an enclosure with an open-top and having first rod-like elements extending from said inner wall inwardly into central space of the enclosure structure; the first rod-like elements being located at different elevations on the inner wall; and a lid fastenable onto and substantially sealable of the open-to-top, said continuous circumscribing inner wall having an inner surface carrying a male member, and a shaft mounted through the lid, said shaft carrying a cranking handle on an upper end thereof adapted to turn said shaft, said lid having a circumscribing downwardly-extending flange extending from an outer circumscribing edge of the lid, and said circumscribing downwardly-extending flange having a diameter between inner wall surfaces thereof adapted such that inner wall surfaces thereof fit wedgingly onto and around upper outer wall surfaces of said open-top vessel's said continuous circumscribing inner wall, and a lid slot being formed in said downwardly-extending flange of a size mateable with said male member when said lid is wedge-mounted onto the open-top vessel, such that said lid anchored against shifting rotatably on said open-top vessel when said cranking handle is cranked; and said shaft carrying fixedly-mounted outwardly-extending second rod-like elements on a lower portion of said shaft located beneath the lid, said second rod-like elements being located at elevations different from the elevations of the first rod-like elements and being movable laterally between said first rod-like elements to mesh with and move past said first rod-like elements when said cranking handle is cranked to turn said shaft when the lid is fastened onto said open-top vessel.

4,160,605
INK RIBBON BOX

August E. Neubaum, Heppenheim, Fed. Rep. of Germany, assignor to Pitney Bowes Deutschland GmbH, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,367
Int. Cl.[2] B41J *33/14*
U.S. Cl. 400—208 12 Claims

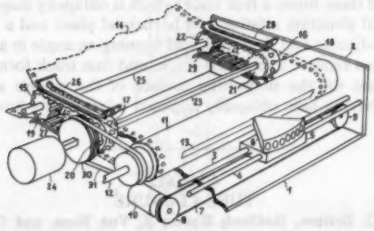


1. An ink ribbon box for use in a small printer, comprising: two cylindrical members oppositely spaced, parallel to one another, a pair of bridging flanges connected to the opposed ends of said two cylindrical members, each of said cylindrical members having an end to end extending opening, means within each of said cylindrical members for receiving an ink ribbon roll, the outer sides of said bridging flanges each having outwardly projecting guide fins which define guide channels thereon, one of said guide channels having a width which is different from the width of the other of said guide channels.

4,160,606
PAPER FEED MECHANISM FOR MULTIPLE COPY PRINTER

Santo Caenazzo, Rho, Italy, assignor to Honeywell Information Systems Italia, Italy

Continuation of Ser. No. 610,362, Sep. 4, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,985
Claims priority, application Italy, Sep. 27, 1974, 27802 A/74
Int. Cl.[2] B41J *15/20*
U.S. Cl. 400—616.2 6 Claims



3. A mechanism for advancing a continuous print-receiving web through a printer, comprising:

a rotatable cylindrical platen;

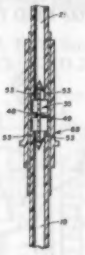
web drive means for engaging said web in zones both upstream and downstream of said platen when said web is partially wound about said platen, said web drive means urging said web toward said platen with a first speed in said upstream zone and pulling said web away from said platen with said first speed in said downstream zone; and

a coupling member for coupling together said web drive means and said platen to provide a peripheral speed for said platen greater than said first speed.

4,160,607
HINGE JOINTS FOR ELONGATED COLLAPSIBLE MEMBERS SUCH AS A FISHING ROD

James R. Reichow, 2912 82nd Cir. North, Brooklyn Park, Minn. 55444

Filed Oct. 17, 1977, Ser. No. 842,492
Int. Cl.[2] F16B *7/10*
U.S. Cl. 403—286 11 Claims



1. In a collapsible elongated member having at least two segments, each of the segments having at least one receiving end, the receiving end having an opening confined entirely therein, an improved hinge joint comprising:

retention means for holding two segments in a substantially contiguous, linear relationship to each other so as to form an assembled member with a receiving end from one of the segments abutting a receiving end from the other segment;

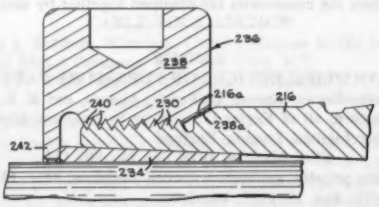
a unitary, nonelastic, flexible hinge formed from an environmentally stable material, the hinge having an elongated central portion between two ends; and

hinge end means integrally formed as part of the hinge ends, the hinge end means securing each end of the hinge to a receiving end of each of the two segments and being freely movable within that portion of the segment adjacent the receiving ends.

4,160,608
PRELOADING NUT FOR WEDGE SLEEVE

William J. Derner, and Connor E. Price, both of Indianapolis, Ind., assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 3, 1978, Ser. No. 874,962
Int. Cl.[2] F16B *2/14*
U.S. Cl. 403—370 3 Claims



1. In apparatus to mount a tubular member on a shaft comprising a wedge sleeve received between said tubular member and said shaft, a nut received on said tubular member and in threaded engagement therewith, said nut having a radially inwardly extending resilient member rigidly connected thereto to engage the outer end of the wedge sleeve as the nut is advanced and to advance the wedge sleeve between the tubular member and the shaft, the improvement wherein said tubu-

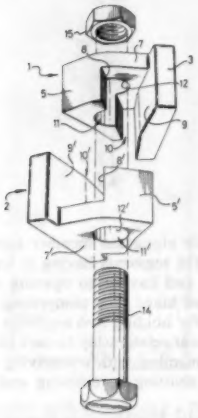
lar member has a tapered surface facing said nut and said nut has a complementary tapered surface to engage and overlay the tapered surface on the tubular member when the nut is tightened on the tubular member to impose a positive limit to expansion of the tubular member by the wedge sleeve.

4,160,609

CONNECTOR FOR BOLTED JOINTS

David B. Jackson, Rampton, and Keith T. Sisson, Mansfield, both of England, assignors to Hollybank Engineering Company Limited, Aylesbury, England

Filed Jan. 27, 1978, Ser. No. 872,755
Int. Cl.[2] B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—407 **7 Claims**



1. A connector for a bolted joint adapted to be mounted on a member to be connected to another member, the connector comprising:

a base portion, an intermediate portion and a key portion;

opposed faces of said base and key portion being inclined and defining a channel which tapers convergingly towards its base, which is provided by said intermediate portion, said opposing faces of said base and key portion also being disposed at an angle to each other so that the channel tapers along its length, said key portion being of complementary shape to said channel so that said connector can be clamped to another similar connector with each of said key portions received in the channel of the other connector, and wherein said connector has a bore therein for receiving a bolt extending through the connector and positioned to register with a bore of a similar connector when the connectors are clamped together by said bolt.

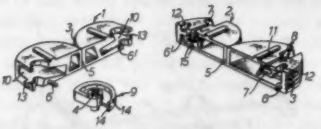
4,160,610

COUPLING DEVICE FOR FURNITURE PARTS

P. Austen-Brown, Barnet; D. Youde, Aintree, and R. F. Pond, Chingford, all of England, assignors to Unerman Greenman Berger Limited, London, England

Filed Mar. 16, 1978, Ser. No. 887,113
Claims priority, application United Kingdom, Mar. 16, 1977, 11154/77; Aug. 15, 1977, 34099/77
Int. Cl.[2] B25G *3/00*; F16D *1/00*; F16B *5/00*
U.S. Cl. 403—407 **11 Claims**

1. An improved device for securing together at right angles two panels of an article of furniture, the device having first and second parts adapted to be received and retained in apertures formed in respective furniture sections to be joined, one part having a rotatable member with a camming surface which engages a part of the other member to secure the two parts together, the improvement being characterised by each part being of cylindrical form with a number of peripheral projections which serve to retain the part within a circular bore provided in the face of a respective panel, the first part having a flat side which locates against the face of the second part with the axes of said first and second parts at right angles, the first part having a rotatable plate which may be turned and caused to project from the flat side, the plate having a rim



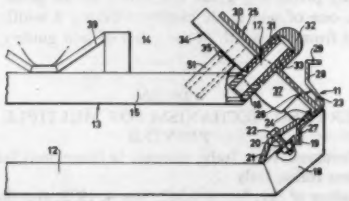
defining by an inward face thereof, an inwardly developing camming surface along its length, the second part having a recess in the face defining a channel into which the plate member of the first part may move, with the camming surface engaging a surface in the channel so that the face of the second part is pulled into firm contact with the flat side of the first part.

4,160,611

SYSTEMS FOR LAUNCHING OR HAULING UP SMALL BOATS

Arne Hveding, Borsa, Norway, assignor to Lade Metall A/S, Trondheim, Norway

Filed Jan. 18, 1978, Ser. No. 870,334
Claims priority, application Norway, Jan. 17, 1977, 770127
Int. Cl.[2] B63C *3/12*
U.S. Cl. 405—2 **10 Claims**



1. System for launching or hauling up pleasure and like small boats which comprises a pair of rails joined together by sleepers and a carriage supported by at least two pairs of carriage wheels to run along the rails, the rails being designed so that each of them forms a first track which is obliquely disposed in a lateral direction relative to a horizontal plane and a second track adjacent said first track and forming an angle in a lateral direction relative to the first track, said first track forming an abutment for the supporting surface of the wheels and the latter having axes obliquely disposed relative to a horizontal plane.

4,160,612

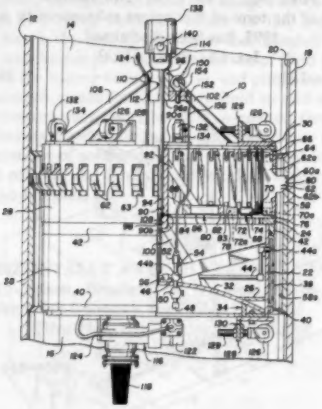
TUBE CLOSURE

Fred G. Britton, Bedford; Robert J. Von Bose, and Cecil T. Keller, both of Arlington, all of Tex., assignors to Oil States Rubber Co., Arlington, Tex.

Filed May 1, 1978, Ser. No. 901,488
Int. Cl.[2] E02B *17/04*
U.S. Cl. 405—227 **8 Claims**

1. In an offshore drilling platform support structure having hollow tubular legs and tubular members slideably disposed through tubular piling guides to secure the platform support structure in place, the tubular members having sealed ends for transporting to the drilling site and a central tube closure, the improvement comprising: a locking ring secured to the inner wall of the tubular member; a support casing; a bulkhead se-

cured to said support casing; seal means on said support casing sealing with the inner wall of the tubular member; connector means moveable between an extended position engaging the locking ring and a retracted position away from said locking ring; retraction means operably secured to said connector



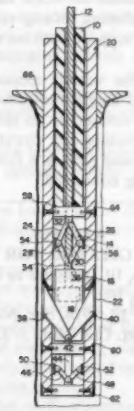
means, said retraction means being arranged to move said connector means from the extended position to the retracted position to permit removal of the central tube closure from the tubular member; and means to equalize pressure on each side of the bulkhead to permit selective flooding of said tubular members.

4,160,613

PILE ANCHOR FOR MOORINGS

Tad Stanwick, 1735 K St. NW., Washington, D.C. 20006

Filed Jun. 23, 1978, Ser. No. 918,616
Int. Cl.[2] E02D *5/74, 27/50*
U.S. Cl. 405—244 **11 Claims**



1. A pile anchor for moorings comprising:

A. A flexible elongated housing;

B. An anchor stock reciprocably positioned within the bottom of said housing and including:

i. a pair of flukes pivoted at their inner ends to said stock and extending outwardly through apertures in said housing, so that their outer ends are engagable with the surrounding seabed;

C. An anchor cable extending axially within said housing and embedded at its lower end within said anchor stock;

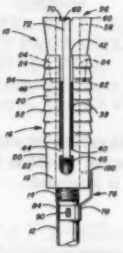
D. A bellis expander assembly pivoted at its top within said housing and said bellis at its bottom being pivoted to said anchor stock, so that two pairs of free ends engage the walls of said housing as expanders during longitudinal reciprocation of said cable and said anchor stock.

4,160,614

EXPANSION SHELL ASSEMBLY AND METHOD FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

Stephen F. Koval, Portage, Pa., assignor to Jennmar Corporation, Cresson, Pa.

Filed Mar. 23, 1978, Ser. No. 889,409
Int. Cl.[2] E21D *21/00*
U.S. Cl. 405—259 **13 Claims**



1. An expansion shell assembly for anchoring a bolt in a bore hole containing adhesive material comprising,

a camming plug threadably engaged to the end of the bolt for axial movement thereon,

an expandable shell having a plurality of longitudinally extending fingers spaced from one another by longitudinal slots,

said fingers each having an inner surface abutting said camming plug and an outer surface adapted to engage the wall of the bore hole,

releasable means securing said camming plug to the bolt for rotating the bolt in a first direction to facilitate mixing of the adhesive material in the bore hole, and

said releasable means being operable upon rotation of the bolt in a second direction to permit rotation of the bolt relative to said camming plug and effect advancement of said camming plug on the bolt to exert an outward force upon said inner surfaces of said fingers to expand said fingers in the bore hole and thereby tension the bolt.

4,160,615

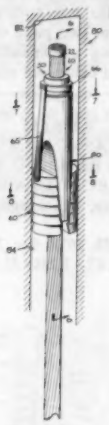
CABLE ROCK ANCHOR

Stanley L. Baldwin, Winnipeg, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 23, 1978, Ser. No. 889,191
Int. Cl.[2] E21D *21/00*
U.S. Cl. 405—259 **7 Claims**

1. An anchor assembly adapted to anchor a cable disposed within a hole comprising, in combination, cable gripping means for gripping said cable while said cable and said anchor assembly are being advanced within said hole, and expandable hole gripping means in contact with said cable gripping means, said cable gripping means comprising a set of conical wedges having toothed faces in contact with said cable and smooth frustoconical outer faces engaging a cooperating smooth frustoconical face communicating with said hole gripping means, said expandable hole gripping means having outer hole-engaging toothed faces and smooth wedge shaped inner faces in contact with smooth wedge faces communicating with said cable gripping means to expand said hole-engaging toothed

faces outwards in response to tension applied to said cable, whereby tension applied to said cable causes said cable gripping means to grip said cable ever more tightly and said hole gripping means to engage the face of said hole ever more tightly as said tension is increased.

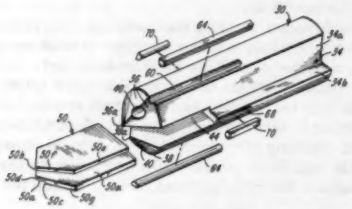


4,160,616

DRILL CONTAINING MINIMUM CUTTING MATERIAL

Michael E. Winblad, 835 N. Hyatt St., Tipp City, Ohio 45371

Filed Oct. 3, 1977, Ser. No. 838,802
Int. Cl.[2] B23B *51/00*
U.S. Cl. 408—144 **7 Claims**



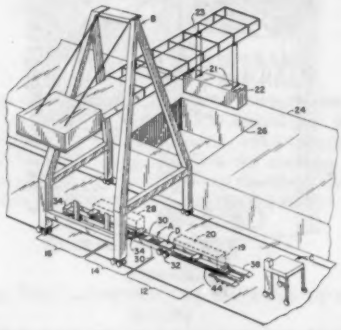
1. A drill of the type having an elongate shank of tool steel material and having a maximum diameter dimension, the shank having a tip part provided with a pair of spaced-apart tapered portions, the improvement comprising a cutting element of cutting material having a hardness greater than said tool steel material and positioned between the tapered portions and attached to the shank, the cutting element having at least four parallel transversely extending surfaces within a total transverse dimension, each of these surfaces having a transverse dimension substantially equal to one-half the maximum diameter dimension of the shank, there being a pair of opposed parallel surfaces which are spaced-apart by a given dimension, the cutting element also having a pair of intermediate opposed parallel surfaces which are spaced-apart less than the given dimension to form a cutting web which has a dimension less than the given dimension each of the transversely extending surfaces having a transverse dimension substantially less than the total transverse dimension of the cutting element.

4,160,617

CONTAINER CONVEYOR APPARATUS AND METHOD FOR VESSEL LOADING CRANE-YARD INTERFACE

Murray M. Montgomery, Oakland; William F. Gilger, Concord, and William W. Steiner, San Francisco, all of Calif., assignors to Matson Navigation Company, San Francisco, Calif.

Filed Aug. 1, 1977, Ser. No. 821,010
The portion of the term of this patent subsequent to Aug. 15, 1995, has been disclaimed.
Int. Cl.[2] B65G *67/00*
U.S. Cl. 414—139 **16 Claims**



1. Apparatus for conveying containers between a vessel crane for loading and unloading containers of at least a first or a second predetermined length from a vessel and the yard classification equipment for distributing containers to and from a container handling yard, the apparatus comprising:

a pair of elongate support members extending along a single file conveyance path including a first work station underlying said vessel loading crane, a second work station at the remote end of said support member and an intermediate support for the support of at least one container between said work stations;

vehicle means underlying the support members and any containers resting thereon for running reversibly along said support members between the work stations, the vehicle means including lifting means for raising said containers from a support position on said support members; and

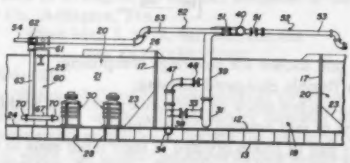
means for moving the vehicle means between said work stations along said single file conveyance path for the movement of said containers on said path over said support members, including first circuit means for determining movement on said path as a function of the length of the container being conveyed.

4,160,618

LIQUID AGITATOR FOR HOPPER

Ezra Sensibar, Chicago, Ill., assignor to David Sensibar Irrevocable Trust, Chicago, Ill.

Filed Feb. 13, 1978, Ser. No. 877,102
Int. Cl.[2] B65G *3/12*
U.S. Cl. 414—142 **16 Claims**



1. In a hopper dredge vessel having a hopper for containing

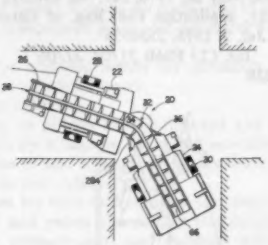
liquid and solid material with the solid material tending to agglomerate at the bottom of the hopper and having a discharge port, agitation apparatus comprising a fluid discharge nozzle disposed closely adjacent to the bottom of the hopper and directed toward areas where solid material tends to agglomerate and toward the discharge port, said fluid discharge nozzle having an input end and a discharge end, the axis of said discharge end being disposed closer to the bottom of the hopper than is the axis of said input end, conduit means connecting said discharge nozzle to a source of fluid for carrying fluid from the source to said nozzle, and pump means coupled to said conduit means for delivering fluid to said nozzle under a high pressure such that the fluid is ejected therefrom in a stream having a velocity and volume sufficient to break up agglomerations of solids and carry them toward the discharge port and prevent the formation of agglomerations at the bottom of the hopper.

4,160,619

HORIZONTALLY ARTICULATED SHUTTLE CAR

Robert C. Nelson, Bluefield, W. Va., assignor to New River Manufacturing Company, Inc., Glen Lyn, Va.

Filed Nov. 4, 1977, Ser. No. 848,761
Int. Cl.[2] B60P *1/38*
U.S. Cl. 414—501 **9 Claims**



1. A mine haulage vehicle comprising:

an elongated body having a front body section and a rear body section which are interconnected by a pivot section to enable said body sections to swing horizontally relative to each other about a vertical pivot axis;

a pair of ground engaging wheels on each of said body sections;

steering means including power means for swinging said body sections relative to one another about said vertical pivot axis;

said front body section having a front floor plate and a pair of front sidewalls defining a front material-carrying conveyor trough;

said rear body section having a rear floor plate and a pair of rear sidewalls defining a rear material-storing load compartment;

said pivot section comprising -

(a) an upper pair of overlapping plates connected respectively to said body sections, a top one of said plates being coplanar with said front floor plate;

(b) a lower pair of overlapping plates connected respectively to said body sections and spaced below said upper pair of overlapping plates;

(c) each of said pairs of overlapping plates being pivotally interconnected about said vertical pivot axis;

(d) a pair of flexible sidewalls extending freely across said top one of said upper pair of overlapping plates connected between said pairs of front and rear sidewalls providing a flexible conveyor trough for guiding material across said pivot section throughout a range of horizontally swung positions of said front and rear body sections;

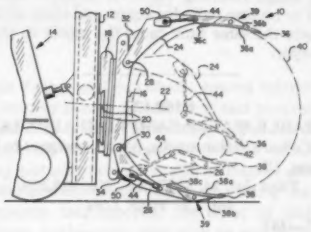
a center strand conveyor trained for orbital movement about reversing means at the front and rear ends of said front and rear body sections respectively, said conveyor having an upper, conveying run movable along the rear floor plate, along the flexible conveyor trough, and along the front floor plate for loading material into the load compartment and for discharging material therefrom, said conveyor having a lower, return run movable from the front to the rear body sections across said lower pair of overlapping plates, said conveyor being horizontally flexible to follow a curved path through the flexible conveyor trough when the front and rear body sections are swung throughout their said range of horizontally swung positions.

4,160,620

LIFT TRUCK PAPER ROLL CLAMP HAVING IMPROVED CONTACT PAD RESTRAINT AND HINGE STRUCTURE

Stanley E. Farmer, Troutdale, and Harry F. Weinert, Portland, both of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Sep. 1, 1977, Ser. No. 829,631
Int. Cl.[2] B66F *9/18*
U.S. Cl. 414—621 **11 Claims**



1. A load-handling clamp adapted to be mounted upon the lifting apparatus at the forward end of a lift truck for engaging a roll of paper comprising:

(a) a frame adapted to be mounted upon said lifting apparatus so as to be selectively movable vertically by said lifting apparatus;

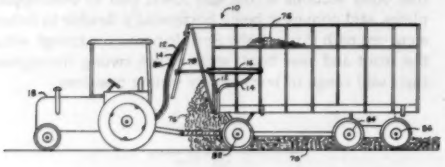
(b) a pair of selectively openable and closeable opposing clamp arms mounted upon said frame projecting longitudinally therefrom in a forward direction, said clamp arms each having longitudinal edges extending longitudinally along opposite sides thereof;

(c) power means mounted upon said frame for selectively opening and closing said clamp arms;

(d) contact pad means hingedly connected to a forward end of a respective one of said pair of clamp arms for pivoting with respect to the respective clamp arm about an axis transverse to said forward direction; and

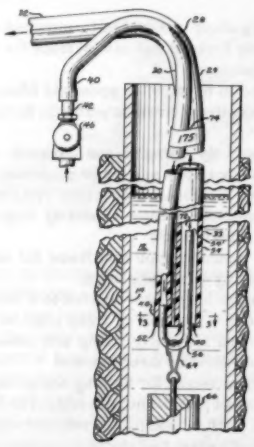
(e) a pair of restraint means for limiting the pivotal movement of said contact pad means with respect to its respective clamp arm, each of said pair of restraint means comprising a forwardly extending elongate member pivotally connected at its forward end to the respective contact pad means and connecting means for slidably connecting the rearward end of said elongate member to the respective clamp arm and limiting the sliding movement of said member with respect to said clamp arm in a forward direction, the elongate member and connecting means of each of said pair of restraint means being located along a respective one of the opposite longitudinal edges of said clamp arm and positioned exterior of the respective edge.

4,160,621
TOTAL HYDRAULIC SILAGE WAGON
Raymond Bishop, Rte. 4, Lawrenceburg, Tenn. 38464
Filed Nov. 4, 1977, Ser. No. 848,500
Int. Cl.[2] B60P 1/38
U.S. Cl. 414—786 1 Claim



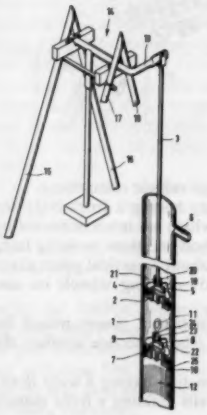
1. A process for unloading silage which comprises setting a lever on a tractor so as to pump hydraulic fluid from an hydraulic fluid tank on said tractor to a pair of hydraulic cylinders, one located on each side of a top-hinged front gate of a wagon being pulled by said tractor, thereby opening said gate, and, substantially at the same time, by pumping hydraulic fluid from the same hydraulic tank, starting an hydraulic motor located on the wagon in juxtaposition with gears to cause said gears to turn an endless chain-type conveyor in the bottom of the wagon and thereby discharge silage from the wagon into a trench silo as said tractor moves therethrough, levelling the silage with axles of the wagon as they move over it, and, after discharging silage, resetting the lever so as to cause the hydraulic fluid to reverse cylinder action and close said door and at substantially the same time cause the motor to stop turning of the conveyor.

4,160,622
PORTABLE WATER SAMPLING APPARATUS
Edward N. Colburn, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.
Filed Jul. 14, 1977, Ser. No. 815,874
Int. Cl.[2] F04F 5/44
U.S. Cl. 417—181 4 Claims



1. A portable water pumping apparatus for sampling water from a well comprising a wound coil of elongated, flexible tubing which is normally stored on a hose reel mounted for rotation on a wheeled cart, said flexible tubing being made of a plastic which has a memory and which has been extruded straight and maintained straight for at least several days prior to coiling, said tubing consisting of a pair of parallel arranged small and large diameter tubing portions integrally joined by a web portion; connector means insertable in the upper end of said small diameter tubing portion and having a threaded portion adapted to engage the threaded portion of a cylinder of pressurized gas; a J-shaped connector formed of a short length of hollow tubing and having its shorter leg inserted in frictional engagement with the inside of said small diameter tubing portion at the lower end thereof, the longer leg having a length of at least 4 inches positioned in the adjacent lower end of said large diameter tubing portion but annularly spaced from the inner walls thereof; a weight member removably suspended from said J-shaped connector; the upper end of said large diameter tubing portion comprising a discharge opening means for discharging water forced up through said annular space and said large diameter tubing portion by gas passing down through the small diameter tubing portion and J-shaped connector from said cylinder when at least a portion of said coil of tubing is unwound and the lower end portion of each tubing portion and the top of the J-shaped connector is submerged beneath the water in a well.

4,160,623
DEEP WELL PUMP
William K. Journey, Greenwood, Miss., assignor to Preussag Aktiengesellschaft, Hanover and Berlin, Fed. Rep. of Germany
Filed May 26, 1976, Ser. No. 690,012
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 2530504; Jul. 9, 1975, 2530576
Int. Cl.[2] F04B 21/04, 21/06
U.S. Cl. 417—238 13 Claims



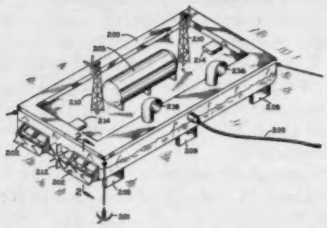
1. A deep well pump comprising a pump cylinder, adapted to be positioned in the ground, a foot valve structure having a foot valve and coupling means thereon, a valved piston movable in said cylinder over a given range of movement and also having coupling means thereon substantially identical to said first mentioned coupling means, and piston actuating means connected to said piston by said coupling means on said piston and having a length such that the actuating means is adapted to extend above the ground, said cylinder having a length such that it extends for a substantial length beyond said range of movement of the piston and also extends above the ground when the cylinder is positioned in the ground in said deep well and having a substantially constant diameter over its length, said substantially constant diameter cylinder also extending beneath said range of movement of said piston and including filter slits therein, and wherein said foot valve structure and said valved piston are substantially identical to and interchangeable with each other and said valved piston is movable during operation relative to said foot valve structure.

4,160,624

WATER VEHICLE-ACTUATED AIR COMPRESSOR AND SYSTEM THEREFOR

Roland L. Smith, Homestead, Fla., assignor to Nu Watt, Inc., Palm Harbor, Fla.

Division of Ser. No. 814,685, Jul. 11, 1977, Pat. No. 4,115,034.
This application Jan. 16, 1978, Ser. No. 870,032
Int. Cl.[2] F04B 35/00
U.S. Cl. 417—330 3 Claims



1. A water wave actuated system for compressing air and thereby generating electrical energy comprising:

an electricity generator operated by compressed air to generate electricity;

air storage means operatively connected to said generator to supply compressed air to said generator for operating the same;

underwater actuator means for actuation in response to waves in a body of water;

a plurality cylinders;

a plurality of pistons having forward and reverse strokes respectively in said cylinders and movable in response to actuation of said actuator means by waves for compressing air in said cylinders;

vent means for each said cylinder communicating with one side of said piston therein for introducing air at atmospheric pressure into said cylinder behind said piston during a forward stroke of said piston;

valve-controlled vent means for each said cylinder communicating with the other side of said piston therein for introducing air at atmospheric pressure into said cylinder on the side of said piston during a reverse stroke thereof;

outlet means communicating with said other side of each said piston for supplying air compressed by said piston during a forward stroke thereof to said air storage means enroute to said electricity generator;

said actuator means comprising a plurality of first paddles totally submerged in the water and horizontally pivoted less than 45 degrees from the horizontal position for up and down movement by waves in the water and operatively coupled to certain of said pistons for reciprocating the latter in the corresponding cylinders;

and said actuator means further comprising a plurality of second paddles totally submerged in the water and horizontally pivoted less than 45 degrees from the vertical position for horizontal back and forth movement by waves in the water and operatively coupled to the remaining pistons for reciprocating the latter in the corresponding cylinders.

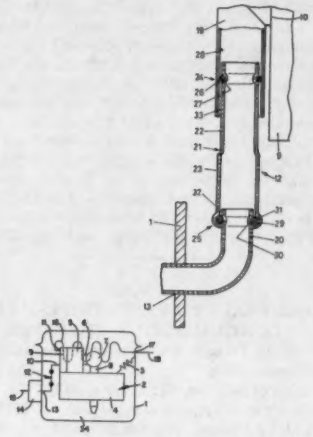
4,160,625

ENCAPSULATED REFRIGERATOR

Jan Dyhr, Sonderborg, and Ole J. Nissen, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 7, 1977, Ser. No. 849,308
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650937
Int. Cl.[2] F04B 17/00, 35/00; F16L 39/04
U.S. Cl. 417—363 2 Claims

1. An encapsulated refrigerator assembly, comprising, a capsule, an integrated motor and compressor unit resiliently mounted in said capsule with said motor unit having a generally vertically extending axis, a compressor inlet port, an inlet port in said capsule, in circumferential alignment with said compressor port but axially and radially offset therefrom relative to the said motor axis, L-shaped pipe fittings for said ports having their free ends in coaxial and axially offset relation to each other, a connecting pipe between said fittings with its end in axially overlapping relation thereto, said connecting pipe having each end with a different diameter than the adjacent



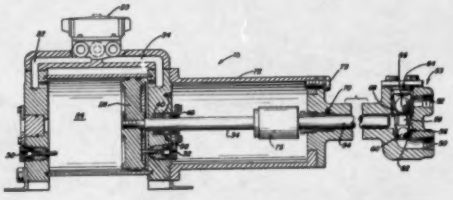
one of said fittings and in radially spaced relation thereto to allow for relative lateral movement of said pipe relative to said fittings, said connecting pipe forming upper and lower articulated joints with said fittings, one of said articulated joints comprising mutually facing annular recesses in said connecting pipe and the corresponding one of said fitting with a resilient O-ring between said recesses, the other of said articulated joints forming a telescopic joint with an annular recess is only one member of said joint to allow telescopic action.

4,160,626

DRIVE ROD COUPLING FOR POSITIVE DISPLACEMENT PUMP

Robert R. Bell, Houston, Tex., assignor to Vapor Corporation, Chicago, Ill.

Continuation of Ser. No. 661,308, Feb. 25, 1978, abandoned.
This application Sep. 19, 1977, Ser. No. 834,797
Int. Cl.[2] F04B 17/00
U.S. Cl. 417—403 3 Claims



1. In a reciprocating pump of the type including a pair of coaxial reciprocating and rectilinearly moving elements for pumping incompressible fluids, one reciprocating element being a piston rod driven by a pressure operated piston and the other being an incompressible fluid plunger slideably mounted in a plunger cylinder for pumping fluid, the improvement comprising:

a coupling device for connecting said rod and said plunger, including

a retainer on one of said members, said retainer comprising a body including a first open end and a second closed end and a side wall defined therebetween, said side wall and said second end defining a chamber within said body, a head on the other of said members,

a plurality of Belleville washer means for resiliently maintaining said head in said retainer to prevent separation of said head and said retainer through the entire stroke of said rod and said plunger, and

a bearing positioned within said chamber between said second end of said body and said head, said bearing being of substantially the same cross-sectional configuration and transverse dimension as said chamber, said bearing including a planar first end abutting a complementary portion of said second end of said retainer, said bearing also including a second end abutting a face of said head, said abutting relationships being the sole means supporting said bearing, said face being of a substantially hemispherical configuration and said second end of said bearing having a face of a complementary configuration to said face of said head, said bearing face and said head face held in abutting relationship throughout said stroke by said resilient means.

4,160,627

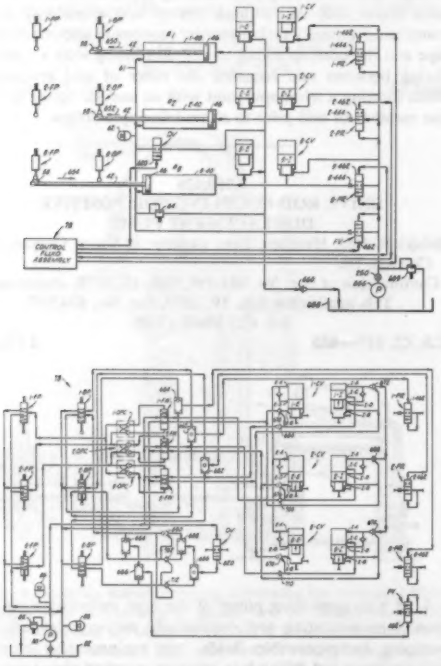
HYDRAULICALLY POWERED TRIPLEX PUMP AND CONTROL SYSTEM THEREFOR

Clinton W. Cole, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 612,510, Sep. 11, 1975, abandoned, which is a division of Ser. No. 489,763, Jul. 18, 1974, abandoned, which is a division of Ser. No. 406,967, Oct. 16, 1973, Pat. No. 3,847,511. This application Apr. 6, 1977, Ser. No. 785,307

Int. Cl.[2] F04B *17/00, 35/04*

U.S. Cl. 417—403 **4 Claims**



1. A hydraulically operated control valve assembly for use in controlling the application of presurized power fluid to a piston and cylinder pump having a power cylinder on one end and a fluid cylinder on the opposite end and a common piston rod assembly longitudinally movably received in the power cylinder and the fluid cylinder, the control valve assembly being of the type which includes:

a power fluid inlet valve body having power fluid entry and exit passages;

a power fluid exhaust valve body having power fluid entry and exit passages;

power fluid inlet sleeve valve means carried by said power fluid inlet valve body for providing selective communication between the power fluid entry passage and the power fluid exit passage of said power fluid inlet valve body;

power fluid exhaust sleeve valve means carried by said power fluid exhaust valve body for providing selective communication between the power fluid entry passage and the power fluid exit passage of said power fluid exhaust valve body;

the entry passage of said power fluid inlet valve body being in continuous communication with a source of pressurized power fluids;

the exit passage of said power fluid exhaust valve body being in continuous communication with a power fluid reservoir;

a common chamber in continuous communication with the power fluid entry passage of said power fluid exhaust valve body and the power fluid exit passage of said power fluid inlet valve body, said common chamber communicating with the power cylinder; and

precompression valve means having a power fluid entry passage, a power fluid exit passage in continuous communication with said common chamber through power fluid flow reducing means, and the entry passage being in continuous communication with the source of pressurized power fluid and being in selected communication with said common chamber through the exit passage and the power fluid flow reducing means, for producing a limited precompression of power fluid in the power cylinder,

in combination with the improvement comprising:

hydraulic control circuit means for providing hydraulic control of said precompression valve means independently of the power fluid, said hydraulic control circuit means including:

a source of pressurized hydraulic control fluid; said precompression valve means including a

hydraulically operated valve member; and further including a hydraulic fluic control entry passage therein, said valve member selectively placing pressurized power fluid in communication with said common chamber and, alternately, for blocking such communication in response to the absence or presence of pressurized hydraulic control fluid at the hydraulic control fluid entry passage, respectively; and

control valve means interposed between and in selective hydraulic communication with said cource of pressurized hydraulic control fluid and the control fluid entry passage of said hydraulically operated precompression valve means for alternately blocking and passing pressurized hydraulic control fluid therethrough in response to the position of the common piston and rod assembly of the piston and cylinder pump; and

said hydraulic control fluid entry passage of said precompression valve means being continuously isolated from said source of pressurized power fluid and isolated from the power fluid exit passage of said precompression valve means.

4,160,628

POSITIVE DISPLACEMENT MACHINE

Manfred Ruoff, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,892
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709174
Int. Cl.[2] F04B *19/02, 29/00*
U.S. Cl. 417—465 20 Claims

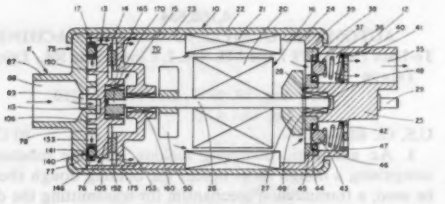
1. A positive displacement machine, comprising a housing bounding an elongated interior compartment; a flat displaceable part-circular element received in said compartment and subdividing the same into a pressure chamber and a suction chamber having a pressure port and a suction port, respectively, said element having a periphery extending over more than 180° of arc and a diameter corresponding to the width of said interior compartment in a direction transverse to the elongation thereof, said displaceable element having in said periphery thereof a recess bounded by two edges which are spaced circumferentially of said periphery; and means for imparting to said element a translatory displacement and for superposing on said translatory displacement an angular movement such that during displacement of said element between two opposite dead center positions said pressure and suction chambers are temporarily placed in communication by said recess so as to permit displacement of a fluid from one to the other chamber.

4,160,629

LIQUID IMMERSIBLE SCROLL PUMP

William P. Hidden, Wenham, and John E. McCullough, Carlisle, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Jun. 17, 1977, Ser. No. 807,414
Int. Cl.[2] F04C *1/02*
U.S. Cl. 418—55 53 Claims



1. A liquid immersible self-lubricating and self-cooling pump, comprising in combination

(a) housing means with liquid inlet and discharge means on opposite ends thereof;

(b) scroll pump means comprising an orbiting scroll member with an end plate and an involute wrap and a stationary scroll member with an end plate and an involute wrap, said scroll pump means being positioned within said housing to receive liquid through said inlet means into a central scroll pump zone and discharge it at a predetermined pressure into a peripheral scroll pump discharge zone, said inlet means comprising a central liquid port in said end plate of said stationary scroll member, the configuration of said central port being defined along one principal boundary by a partial tracing of the edge of said wrap of said orbiting scroll member and along another principal boundary by a line coinciding with a straight line drawn as a tangent to the generating radius of said wrap of said stationary scroll member;

(c) driving means within said housing arranged to drive said orbiting scroll member to experience orbiting motion with respect to said stationary scroll member; and

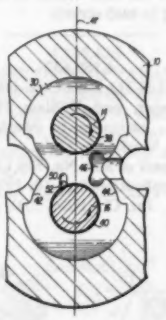
(d) coupling means to maintain a predetermined angular relationship between said scroll members; the flow of liquid through said scroll pump and said housing means around said driving means and into said liquid discharge means being such as to effect (1) tangential sealing between said involute wraps making moving line contact as said orbiting scroll member is driven, and (2) axial sealing to prevent radial leakage between said end plates and said involute wraps of said scroll members, whereby said scroll pump means is essentially self-sealing.

4,160,630

GEAR PUMPS WITH LOW PRESSURE SHAFT LUBRICATION

Barry Wynn, Tarrant Gunville, England, assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,650
Claims priority, application United Kingdom, Feb. 1, 1977, 3999/77
Int. Cl.[2] F04C *15/00*
U.S. Cl. 418—102 5 Claims



1. An improved rotary gear pump comprising:

a housing having an inlet and an outlet chamber;

a pair of shafts mounted for rotation in said housing on bearings supported by said housing;

a pair of gears, one mounted on each of said shafts, said gears having gear teeth intermeshing at a zone located between said inlet chamber and said outlet chamber; said gear teeth sequentially enclosing volumes of fluid therebetween as said gears intermesh in said zone;

at least one seal plate located between said bearings and said gears with said shafts extending through said seal plate;

channel means in said seal plate, originating adjacent to said zone at a location in which said channel means is open to receive fluid from said volumes between said intermeshing teeth only while said volumes are increasing, for directing fluid from said zone through one of the bearings adjacent said seal plate;

means for receiving fluid from said one bearing and directing it through the other bearing on the adjacent shaft; and

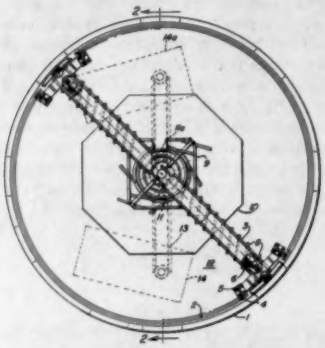
means for receiving fluid from said other bearing and returning it to said inlet chamber.

4,160,631

PRILL TOWER RAKE

Robert M. Stewart, and Robert W. Schwartz, both of Memphis, Tenn., assignors to W. R. Grace & Co., New York, N.Y.

Filed Sep. 13, 1977, Ser. No. 832,933
Int. Cl.[2] B29C *23/00*
U.S. Cl. 425—10 9 Claims



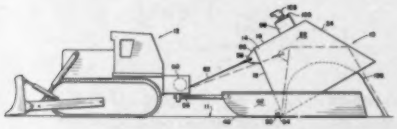
1. Prill cooling and collecting apparatus including means for dropping prills through a prilling tower onto a screen, said screen being positioned over an air plenum having an air source; wherein the improvement comprises (a) at least one central opening in said screen for exit of said prills, (b) a rake positioned over said screen, said rake having arms pivoting over the screen center, said arms carrying rake beams, and (c) rake drive means for the rake beams to rake the prills toward said central opening in said screen.

4,160,632

APPARATUS TO DISPOSE OF FLY ASH

William F. Scriminger, and William H. Ricketts, both of Muskogee, Okla., assignors to Muskogee Environmental Conservation Co., Muskogee, Okla.

Continuation-in-part of Ser. No. 776,115, Mar. 10, 1977, abandoned. This application Apr. 10, 1978, Ser. No. 894,915
Int. Cl.[2] B29C *5/02*
U.S. Cl. 425—62 10 Claims



1. A fly ash disposal system comprising:

(a) a container enclosed by side walls and an upper closed top member, the bottom thereof being open, the said sidewalls being tapered upwardly and inwardly to the closed top member;

(b) fly ash inlet provided in the upper portion of the container for receiving air blown fly ash therethrough;

(c) liquid spray means carried by the container and disposed within the upper portion of the container for settling and caking the incoming fly ash;

(d) exhaust filter means carried by the upper portion of the container and in communication with the interior thereof;

(e) means attached to said container for assisting the removal of said container, and

(f) removal means associated with said attached means for removing the container without disturbing the caked fly ash;

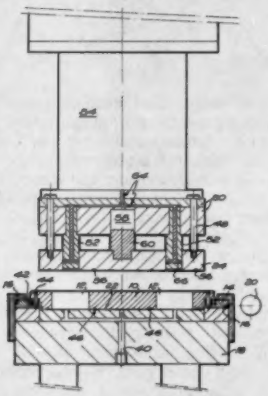
whereby fly ash is blown into the container through the fly ash inlet and is settled to the bottom thereof by liquid spray from the liquid spray means for ultimately hardening the fly ash into a fly ash cake, the resultant air being removed by expulsion through the filter means.

4,160,633

APPARATUS FOR MOULDING COMPONENTS IN COMPACTABLE MATERIALS

Kenneth H. Strawson, and Gerald Spencer, both of Sheffield, England, assignors to National Research Development Corporation, London, England

Filed May 31, 1978, Ser. No. 911,155
Claims priority, application United Kingdom, Jun. 15, 1977, 25137/77
Int. Cl.[2] B30B *4/28*
U.S. Cl. 425—85 9 Claims



1. In apparatus for moulding components in compactable materials, a die plate having at least one die cavity, a filter assembly adapted to form a closure member for said at least one die cavity at one side of said die plate, and means for injecting a slurry material into the at least one die cavity and for maintaining a slurry pressure within the mould cavity sufficient to achieve a required density of finished compact, the filter assembly being constituted by a filter block with a grooved surface and a filter pad in abutment with said grooved surface.

4,160,634

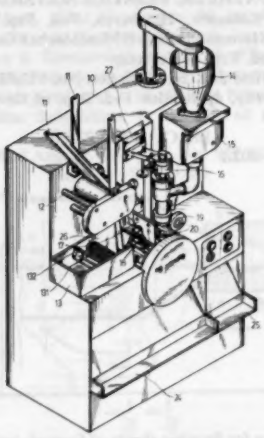
AUTOMATIC DUMPLING MAKING MACHINE

Te-Hsiu Huang, 79 Lane 225, Sec. 1, Chung-Hua Rd., Taichung, Taiwan

Filed Aug. 19, 1977, Ser. No. 826,210
Int. Cl.[2] A21C *9/06, 9/08*
U.S. Cl. 425—112 10 Claims

1. An automatic dumpling making machine substantially comprising a dough sheet holder for holding dough sheets to be used; a transmission mechanism for transmitting the dough sheets; a flour container for containing flour to be applied over the sheets; a stuffing hopper for storing stuffings; a stuffing control device for controlling the amount of stuffings to be fed into a sheet; a stuffing feeding device for feeding stuffings into a sheet; a hitting device for hitting the central part of the sheet to form a dent for receiving stuffings; two polygon-shaped rotating wheels; a plurality of dumpling forming devices mounted on the peripheral surfaces of said two polygon-shaped rotating wheels for folding up the dough sheet to form a dumpling; a pushing rod for pushing the finished dumplings out of the forming device; a fixed and a movable brush means for cleaning the dumpling forming device; and a dumpling collector and a dough sheet collector for collecting the finished dumplings and remaining dough sheets respectively,

wherein each dough sheet is transmitted by the transmission mechanism to one of the dumpling forming devices where the sheet is hit by the hitting device to form a central dent and stuffings are fed into the dent from the hopper through the stuffing controller, and the forming device then folds up the dough sheet and cuts the same into a desirable shape and size, said movable brush comprising a brush part and a handle



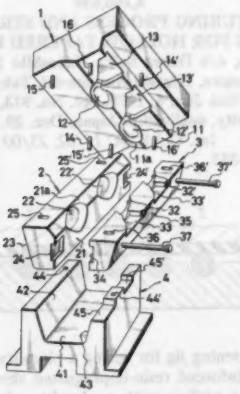
whose one end is formed into a ring groove for receiving one head of a fork, and the other end of the fork being secured to a seat, the fork having an arm with a wheel mounted thereon for engaging with a cam having a lobe so that when said cam lobe comes into contact with the wheel the fork is forced to rotate with respect to the fixed fork head and pull the brush backward, the brush being thereafter spring means pushed forward again.

4,160,635

APPARATUS FOR PRODUCING WOODEN HEADS OF GOLF CLUBS

Yosaku Ikeda, 7229, Fukumitsu-cho, Nishitonami-gun, Toyama-ken, Japan

Filed Aug. 8, 1977, Ser. No. 822,832
Claims priority, application Japan, Aug. 10, 1976, 51-106682
Int. Cl.[2] B29C *6/00, 17/00*
U.S. Cl. 425—128 **7 Claims**



1. A molding apparatus for producing wooden heads of golf clubs including:

an upper mold member and a pair of lower mold members, said upper mold member and lower mold members forming cavities for receiving resin-impregnated wooden head materials to be subjected to compression molding;

a bed having a receiving groove for receiving said lower mold members, said receiving groove having inclined inside walls for pressing said lower mold members together by wedge action;

said lower mold members having facing sides facing toward each other; a protruding member having one portion between said facing sides and having a second portion protruding beyond one end of said facing sides of said lower mold member;

wherein said protruding member is comprises of relatively hard resilient materials which are interposed between said pair of lower mold members, means formed in at least one of said facing sides for receiving said protruding member therein and this said means and said protruding member being so shaped that upon said lower members being pressed together by said inclined inside walls, said protruding member is compressed and upon said lower mold members being released from being pressed by said inclined walls, said protruding member resiliently urges said lower mold members apart;

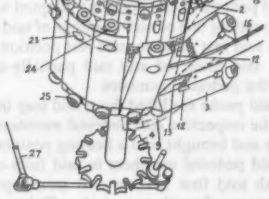
an upper hot plate carrying said upper mold member, and a lower hot plate carrying said bed thereon.

4,160,636

INJECTION MOLDING APPARATUS FOR THE MANUFACTURE OF ZIPPERS

Dino Magherini, Via Osservatorio 36, Florence, Italy

Filed Sep. 27, 1977, Ser. No. 837,149
Claims priority, application Italy, Sep. 30, 1976, 9607 A/76; Sep. 20, 1977, 9573 A/77
Int. Cl.[2] B29D *5/00*; B29F *1/00*
U.S. Cl. 425—129 R **9 Claims**

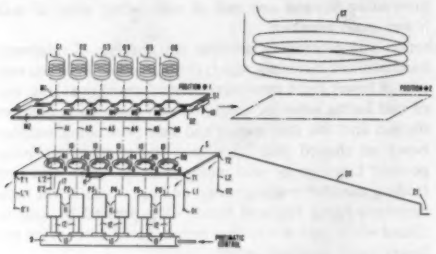


1. Apparatus for the manufacture of zippers comprising a rotor having a vertical axis, means for intermittently rotating said rotor around said vertical axis, a plurality of molds carried by said rotor, each mold including two mold sections one being fixed and the other movable to open and close the mold, and an injection station adjacent said rotor including means for injecting material into the molds as they successively pass the injection station, said fixed mold section being secured to the rotor, said movable mold section including a hinge connection with said rotor at the lower end of the movable mold section.

4,160,637
APPARATUS FOR TREATING A SPINNERET PLATE TO BE REUSED INTO THE MANUFACTURE OF SYNTHETIC FIBERS

Theodore M. Jordan, Columbia, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 12, 1978, Ser. No. 869,072
Int. Cl.[2] D01D *3/00*
U.S. Cl. 425—225 1 Claim



1. An apparatus for treating by induction heating a spinneret pack including an outer ring surrounding a combined spinneret plate and filter assembly, said filter assembly, spinneret plate and outer ring being united by unprocessed polymer material fed for extrusion through said filter assembly and through holes in said spinneret plate during the manufacturing of synthetic fibers; the apparatus comprising:

first heating coil means having a plurality of individual coils;

second induction heating coil means;

a tray having a plurality of receptacles for receiving in a one to one relationship a like plurality of spinneret packs when in a loading position;

said first coil means including a like plurality of individual heating coils each associated to a spinneret pack;

said tray being movable from said loading position into a rest position for which said receptacles are aligned with the respective said individual coils;

each receptacle having a bottom surface defining an opening, with each said bottom surface being adapted to receive one of said packs with the spinneret plate face down;

a like plurality of pedestal members movable along the common axes of said individual coils and said openings when said tray is in the rest position, said pedestal members being movable from a retracted position to a fully-extended position and back to a partially-extended position intermediate between said fully-extended position and said rest position;

each of said pedestal members being adapted to pass through a corresponding one of said openings of said tray when the tray is in said rest position, said rest position being located between said retracted and said partially-extended positions of the pedestal members;

whereby said packs are lifted from said tray in the rest position by the respective said pedestal members through said openings and brought into a heating position corresponding to said pedestal members in said fully-extended position, with said first heating coil means preheating said pack during a first time period sufficient to detach by gravity each of said outer rings from the respective said packs onto a corresponding receptacle of said tray;

with means operative on each combined filter assembly and spinneret plate, when said pedestal members are retracted to said partially-extended position, for transferring said filter assembly and spinneret plate as a unit into an operative position relative to said second induction heating coil means;

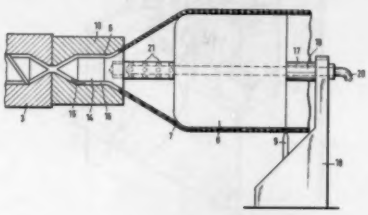
said second coil means being operable upon each said combined filter assembly and spinneret plate during a second time period sufficient to carbonize the material accumulated during extrusion in the holes of any of said spinneret plates and to detach each of said spinneret plates from the associated filter assembly by gravity; and

means for collecting the detached spinneret plates.

4,160,638
APPARATUS FOR FORMING SHEETS OF FOAMED SYNTHETIC PLASTICS MATERIAL

Klaus-Dieter Kolossow, Hamburen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinebau GmbH, Hanover Kleefeld, Fed. Rep. of Germany

Filed Jan. 26, 1978, Ser. No. 872,637
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704231
Int. Cl.[2] B29D *27/00*
U.S. Cl. 425—302.1 1 Claim

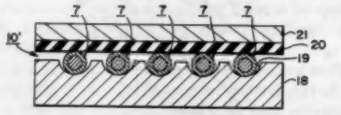


1. Apparatus for forming sheets of foamed synthetic plastics material, comprising a screw extruder, a nozzle head having an extrusion passage therein and a nozzle core positioned in the extrusion passage so as to form an annular nozzle, a cooled calibrating mandrel of a diameter larger than that of the annular nozzle, disposed downstream of the screw extruder having regard to the direction of extrusion and mounted on a stand, blowing means operatively associated with said annular nozzle for applying internal pressure to an extruded tube between the annular nozzle and the calibrating mandrel to increase the diameter of the tube, cutting apparatus for cutting open the increased-diameter cooled foamed plastics tube, and apparatus downstream of the cutting apparatus for laying out flat the cut-open tube, wherein the nozzle core is rigidly connected to the stand of the calibrating mandrel and is connected to the inner wall of the extrusion passage by a single web located within the nozzle head at a position at which the tube is eventually cut open by the cutting apparatus.

4,160,639
MANUFACTURING PROCESS AND STRAIGHTENING JIG FOR HOLLOW TAPERED RODS

Toyoji Umeda, c/o Daiwa Seiko Kabushiki Kaisha, 14-16, 3-chome, Maesawa, Higashi Kurume-shi, Tokyo, Japan

Filed Jun. 6, 1978, Ser. No. 913,173
Claims priority, application Japan, Dec. 29, 1977, 52-158171
Int. Cl.[2] B29C *17/02, 25/00*
U.S. Cl. 425—383 9 Claims



1. A straightening jig for curing a plurality of wound semi-cured fiber-reinforced resin-impregnated sheets comprising a body having a surface with a plurality of grooves formed therein, the grooves being shaped so as partially to receive the wound sheets with a portion of each of the wound sheets protruding above the groove in which the wound sheet is partially received, and securing means for securing the wound

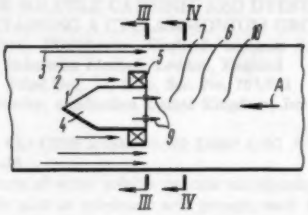
sheets in the grooves said securing means including an elastromeric layer for pressing against said wound sheets.

4,160,640

METHOD OF FUEL BURNING IN COMBUSTION CHAMBERS AND ANNULAR COMBUSTION CHAMBER FOR CARRYING SAME INTO EFFECT

Vladimir A. Maev, ulitsa Granitnaya, 36, kv. 46; Andrei L. Kuznetsov, ulitsa S. Kovalevskoi, 16/4, kv. 141; Jury A. Lamm, ulitsa S. Kovalevskoi, 16, kv. 79; Viktor V. Ivakhnenko, Tovarischesky prospekt, 4, kv. 373; Anatoly V. Sudarev, ulitsa Georgievskaya, 2, kv. 57, and Nikolai N. Prokushenkov, ulitsa Babushkina, 8, kv. 177, all of Leningrad, U.S.S.R.

Filed Aug. 30, 1977, Ser. No. 829,152
Int. Cl.[2] F23M *3/00*
U.S. Cl. 431—9 5 Claims



1. A method of burning fuel in an annular combustion chamber, comprising predividing primary and secondary air into discrete coaxial annular streams;

swirling of said coaxial annular streams of primary air tangentially about a longitudinal axis of streams;

adjacent coaxial annular streams of primary air being swirled in opposite directions;

admitting the swirled coaxial annular streams of primary air and a portion of said coaxial annular streams of secondary air into a burning zone of an annular combustion chamber;

injecting fuel into said burning zone simultaneously with admission of said swirled coaxial annular streams of primary air and of said portion of the coaxial annular streams of secondary air to produce a recirculation flow of the fuel-air mixture; and

admitting the remaining portion of said coaxial annular streams of secondary air to a mixing zone of said combustion chamber wherein products of combustion and secondary air are mixed;

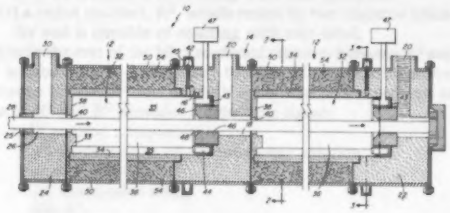
whereby streamlines of said recirculation flow of the fuel-air mixture are developed transversely in said combustion chamber, thus developing a reduced temperature in said burning zone.

4,160,641

CONTINUOUS FURNACE

Gabor Miskolczy, Carlisle, Mass.; Leonard G. Nowak, Ypsilanti, and Paul K. Shefsiek, Farmington, both of Mich., assignors to Holcroft & Company, Livonia, Mich.

Filed Mar. 21, 1978, Ser. No. 888,714
Claims priority, application Canada, Sep. 15, 1977, 286780
Int. Cl.[2] F27B *9/28*
U.S. Cl. 432—59 13 Claims



1. A furnace comprising:

(a) elongated furnace chamber means defining a central workpiece path therethrough and an inner surface surrounding said path;

(b) first means surrounding said path at one end of said chamber means for directing into said chamber means one component for a combustible mixture as a stream substantially parallel to and surrounding said path; and

(c) a second means surrounding said path at said one end of said chamber means for directing radially into said chamber means another component for a combustible mixture as a stream surrounding said path which flows substantially normal to said path, said first and second means being arranged for directing said streams into intersection with each other for producing a uniform combustible mixture in a ring around said path, whereby, upon combustion a uniform flame ring surrounds said path for heating workpieces thereon and for heating said inner surface.

4,160,642

METHOD FOR PREPARING DYE SOLUTIONS

Fred A. Desiderio, Cornwells Heights, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 379,530, Jul. 16, 1973, Pat. No. 3,954,397.
This application Sep. 17, 1975, Ser. No. 614,120
Int. Cl.[2] D06P 3/32
U.S. Cl. 8—12 19 Claims

1. A process for increasing the solubility of a hydroxyazo metal chelate dye in an effective solvent substantially free from active hydrogen atoms as determined by the Zerewitinoff Method which comprises treating said dye with a copolymer of oxazolidinylethyl methacrylate and one or more monomers copolymerizable therewith.

4,160,643

WATER SOLUBLE CATIONIC AZO DYESTUFFS CONTAINING A CYCLAMMONIUM GROUP

Peter Gregory, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 27, 1976, Ser. No. 757,913
Claims priority, application United Kingdom, Jan. 27, 1976, 3067/76
Int. Cl.[2] C09B 27/00, 46/00; D06P 1/10, 3/70
U.S. Cl. 8—26 1 Claim

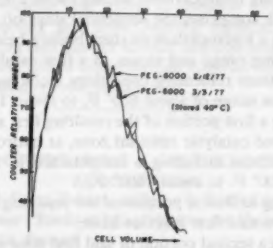
1. A mixture of water soluble cationic azo dyestuffs devoid of carboxylic acid or sulphonic acid groups, each dyestuff in said mixture containing at least one cyclammonium group and said dyestuffs differing only in the constitution of the said cyclammonium group, said cyclammonium group being a gamma-picolinium group in one dyestuff and a beta-picolinium group in another dyestuff in said mixture, the water-solubility of said mixture being superior to that of the individual dyestuffs.

4,160,644

PLATELET REFERENCE CONTROL AND METHOD OF PREPARATION

Wayne L. Ryan, Omaha, Nebr., assignor to Streck Laboratories, Inc., Omaha, Nebr.

Filed Jun. 13, 1977, Ser. No. 805,810
Int. Cl.[2] G01N 33/16
U.S. Cl. 23—230 B 5 Claims



1. A method of preparing a fixed platelet reference control comprising the steps of stabilizing a fixed platelet reference control against false counts due to container adsorption by adding a solid polyethylene glycol as a stabilizing agent to one member selected from the two member class consisting of an aldehyde fixed platelet suspension member and an isotonic diluent member for a platelet suspension, and thereafter adding the other member to the mixture resulting from the first adding step whereby a control is achieved that is substantially time and agitation stable.

4,160,645

CATALYST MEDIATED COMPETITIVE PROTEIN BINDING ASSAY

Edwin F. Ullman, Atherton, Calif., assignor to Syva Company, Palo Alto, Calif.

Filed Jul. 14, 1977, Ser. No. 815,636
Int. Cl.[2] G01N 33/16, 31/10, 21/22
U.S. Cl. 23—230 B 27 Claims

1. A method for measuring an analyte suspected of being present in an unknown, wherein said analyte is a member of an immunological pair consisting of ligand and antiligand, wherein three reactants are employed;

(1) conjugated label, wherein said label is conjugated either directly or indirectly to ligand analog to form labeled ligand, wherein ligand analog is capable of competing with ligand for antiligand and said label is capable of reacting by both one and two electron transfers;

(2) a redox reactant, R^1, which reacts by one electron transfer and is capable of reacting with said label; and

(3) a redox reactant, R^2, which reacts by two electron transfer and is capable of reacting with said label,

wherein the rate of the label mediated reaction between R^1 and R^2 is substantially greater than the rate of the direct reaction between R^1 and R^2 and wherein either one or the product of one of R^1 and R^2 provides a detectible signal;

said method comprising;

(a) combining in an aqueous assay solution:

(i) said unknown;

(ii) conjugated label;

(iii) R^1;

(iv) R^2; and

(v) antiligand when said analyte is ligand; and

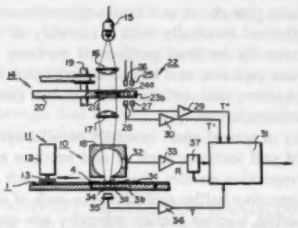
(b) determining the rate of reaction between R^1 and R^2 as compared to said rate in an assay solution having a known amount of analyte.

4,160,646

METHOD OF ANALYZING LIQUID SAMPLES AND SYSTEM FOR CONTINUOUSLY AUTOMATICALLY ANALYZING SAME

Yoshikazu Furutani, and Shinichi Kishimoto, both of Kyoto, Japan, assignors to Kabushiki Kaisha Kyoto Daiichi Kagaku, Kyoto, Japan

Filed Nov. 21, 1977, Ser. No. 853,137
Claims priority, application Japan, Jan. 20, 1977, 52-5508
Int. Cl.[2] G01N 21/30, 21/48, 31/22, 33/16
U.S. Cl. 23—230 R 16 Claims



1. A method of analyzing a liquid sample comprising the steps of applying the sample to a composite test medium formed of a strip having thereon a reflectivity reference piece and at least one color reaction test piece feeding the test medium to spectral reflectivity measuring means, irradiating each of the pieces with energy of a plurality of predetermined different wavelengths, and obtaining corrected reflectivities of each of the test pieces as the relative values with respect to the reflectivity of said reflectivity reference piece from the amounts of reflected energy at at least some of the different wavelengths to measure the concentration of an abnormal substance contained in the test sample.

4,160,647

CONTINUOUS OPERATION EXTRACTOR

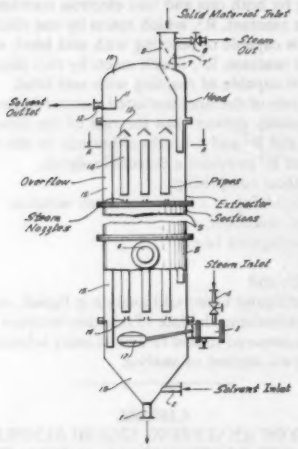
Stoyan H. Sendov, Sofia; Stoyan I. Evtimov, Vidin; Ivan A. Nikolov, Vidin; Ivan A. Kuklin, Vidin; Mircho G. Mirchev, Vidin, and Nicolas S. Dimov, Vidin; all of Bulgaria, assignors to Chimkombinat, Vidin, Bulgaria

Continuation of Ser. No. 710,633, Aug. 2, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,152

Claims priority, application Bulgaria, Aug. 2, 1975, 30713

Int. Cl.[2] B01D *11/02*

U.S. Cl. 422—106 3 Claims



1. A continuous-operation extractor for the solvent extraction of solids, comprising:

a column formed with a discharge chamber at its bottom, a plurality of extractor sections disposed one above another above said chamber, and a head formed above the uppermost section;

a solids inlet pipe above said head and communicating therewith, formed internally with a plurality of downwardly and inwardly inclined perforated surfaces over which solids can pass into said head, said inlet pipe being further formed above said surfaces with a steam outlet provided with a throttle valve;

a plurality of spaced-apart mutually parallel upright pipes in each of said sections, each of said sections being formed with respective nozzles opening below each of said pipes and respective baffles spaced above each of said pipes and of inverted V-cross section whereby jets emerging from said nozzles induce a circulation of solids, solvent and gas upwardly through said pipes and around between said pipes of each section;

a solvent outlet in said head;

respective overflows connecting each upper section with the next lower section and the lowermost section with said chamber;

a solids outlet formed in the bottom of said chamber;

a solvent inlet opening into said chamber; and

a steam inlet opening into a float-controlled valve connected to said chamber for controlling the level of material therein to maintain a steam-gas layer in said chamber below the nozzles of said lowermost section.

4,160,648

FUEL COMPOSITIONS CONTAINING DEPOSIT CONTROL ADDITIVES

Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 730,495, Oct. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 700,922, Jun. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 698,243, Jun. 21, 1976, abandoned. This application May 27, 1977, Ser. No. 801,441

Int. Cl.[2] C10L *1/22;* C07C *125/06;* C07D *295/14*

U.S. Cl. 44—63 22 Claims

1. A fuel composition comprising a major portion of hydrocarbons boiling in the gasoline range and from 30 to 2000 ppm of a poly(oxyalkylene) carbamate having at least one C_1–C_{30} hydrocarbyloxy-terminated poly(oxyalkylene) chain of 2 to 5 carbon oxyalkylene units bonded through an oxycarbonyl group to a nitrogen atom of a polyamine; said polyamine having from 2 to 10 amine nitrogens and from 2 to 40 carbon atoms, said carbamate having a molecular weight of from about 500 to 10,000.

4,160,649

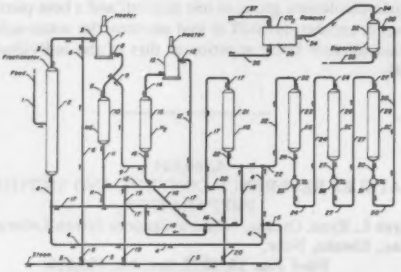
SUBSTITUTED NATURAL GAS VIA STEAM REFORMING OF KEROSENE

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1978, Ser. No. 936,957

Int. Cl.[2] C10G *11/28;* C10K *3/06*

U.S. Cl. 48—214 A 10 Claims



1. A multiple-stage, steam reforming process for producing a methane-rich substitute natural gas from a kerosene charge stock, containing hydrocarbons boiling above a temperature of 450° F., which comprises the sequential steps of:

(a) reacting a hydrocarbon mixture boiling below the kerosene boiling range and steam, in a first catalytic reaction zone, a steam reforming conditions including a temperature in the range of about 800° F. to about 1025° F.;

(b) reacting a first portion of the resulting first zone effluent, in a second catalytic reaction zone, at hydrogen-producing conditions including a temperature in the range of about 1200° F. to about 1600° F.;

(c) recycling at least a portion of the resulting second zone effluent to said first reaction zone;

(d) reacting a second portion of said first zone effluent and a first portion of said kerosene charge stock, in a third catalytic reaction zone, at steam reforming conditions including (i) a minimum catalyst bed inlet temperature of about 840° F. and, (ii) a maximum catalyst bed outlet temperature of about 1,000° F.;

(e) reacting at least a portion of the resulting third zone effluent and a second portion of said kerosene charge stock, in a fourth catalytic reaction zone, at steam reforming conditions including (i) a minimum catalyst bed inlet temperature of about 840° F. and, (ii) a maximum catalyst bed outlet temperature of about 1000° F.; and,

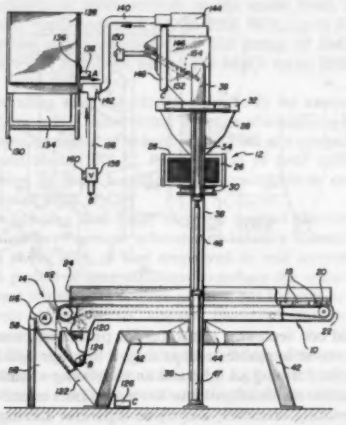
(f) recovering said methane-rich substitute natural gas from the resulting fourth reaction zone product effluent.

4,160,650

SAND CORE CLEANING APPARATUS WITH DOUBLE ROLLER DELIVERY OF CLEANING MATERIAL

Brian J. Jensen, Franksville, Wis., assignor to NFE International, Ltd., Palatine, Ill.

Filed Apr. 20, 1978, Ser. No. 898,201
Int. Cl.[2] B24B *31/00*; B24C *3/10*
U.S. Cl. 51—16 11 Claims



1. Apparatus for removing fins from sand cores using a core cleaning material comprising:

a frame;

a core conveyor mounted to said frame for transporting said sand cores during removal of said fins;

counter-rotating roller means mounted to said frame above said core conveyor for delivering a falling curtain of said core cleaning material onto said cores for removal of said fins, including,

a pair of rotatably engaging rollers mounted to transversly extend substantially across said core conveyor and defining a contact surface junction;

means for feeding said core cleaning material above said contact surface junction; and

means for rotating said rollers in opposite rotational directions, enabling said core cleaning material to be withdrawn from said contact surface junction and deposited as a falling curtain of core cleaning material onto said cores to substantially remove said fins.

4,160,651

METHODS OF TREATING A GASEOUS MIXTURE OF ADSORPTION

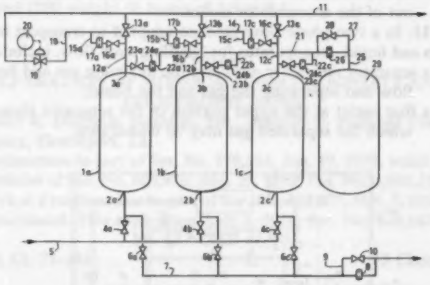
Claude Pivard, Paris, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 29, 1977, Ser. No. 828,546
Claims priority, application France, Sep. 7, 1976, 76 26868
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—26 3 Claims

1. A method of treating a gaseous mixture by adsorption which employs the selective arrest of at least one component of said gaseous mixture, using three adsorbent beds and a buffer container, comprising performing sequentially the following cycle relating to a first bed of said beds:

(a) a high pressure phase extending over a first third of said cycle, during which a treated gas is withdrawn which results from passing the said mixture through a first adsorbent bed in a direction termed the production direction at virtually constant high production pressure,

(b) a regeneration phase of said first adsorbent bed extending over a second third of said cycle consisting firstly of a de-pressurization phase from the high production pressure to a low regeneration pressure, said de-pressurization phase including two successive balancing operations firstly between said first adsorbent bed and a second adsorbent bed and secondly between said first adsorbent bed and said buffer chamber each of said balancing operations being effected with outfeed in the production direction and infeed in the opposite direction and a continuous removal of gas in the opposite direction from the production direction during the whole duration of said de-pressurization phase on one hand and finally of a cleaning phase at said low regeneration pressure which is performed by passing gas from said buffer chamber through said first adsorbent bed in the opposite direction from the direction of production,



(c) a re-pressurization phase extending over a third of said cycle, consisting of a balancing between said first adsorbent bed and a third adsorbent bed which is at the beginning of its regeneration phase, in the opposite direction from the direction of production, and a continuous introducing of treated gas in the direction opposite the direction of production, extending over the whole duration of said re-pressurization phase,

repeating said cycle for each of said three adsorbent beds in sequence with a stagger of a third of a cycle, introducing said mixture into said beds in sequence at a constant rate and pressure throughout said cycle, removing said treated gas from said beds in sequence at a substantially constant rate and pressure throughout said cycle, and removing from said beds in sequence, at a rate and pressure that are substantially constant throughout said cycle, gas that has passed through said beds in said opposite direction from the production direction.

4,160,652

METHOD AND APPARATUS FOR HANDLING THE FLUIDS IN A TWO-PHASE FLOW PIPELINE SYSTEM

Robert E. Martin, Spring, and Ernest P. Hagan, Jr., Houston, both of Tex., assignors to Texas Eastern Engineering, Ltd., Houston, Tex.

Filed Aug. 26, 1977, Ser. No. 828,191
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—46 14 Claims

1. In a two-phase flow pipeline adapted to transport both gas and liquid, a method of handling such flow including the steps of:

supplying the gas and liquid flow stream of the pipeline into a separator and separating the incoming flow stream into gas and liquid;

withdrawing from the upper portion of the separator the gas separated by the separator;

within the parameters of the system, continuously withdrawing from the lower portion of the separator the separated liquid, whereby when the incoming flow contains both liquid and gas the liquid is being withdrawn from the lower portion of the separator at the same time as the gas is being withdrawn from the upper portion of the separator;

supplying the separated liquid into an elongated accumulator means and against a movable piston positioned in such accumulator means, said accumulator means being in fluid communications at its upstream end with the liquid outlet of the separator and in fluid communication at its downstream end with the gas outlet of the separator;

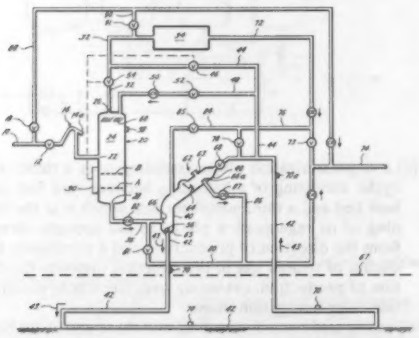
said accumulator means being positioned with respect to said separator whereby the hydraulic head of the separated liquids above the movable piston causes the accumulating liquids to move downstream into the elongated accumulator means; and

after a selected quantity of liquid has been accumulated in the accumulator means, supplying gas under pressure into the accumulator means to force the liquid stored therein out of the accumulator means.

11. In a two-phase flow pipeline adapted to transport both gas and liquid, an apparatus for handling such flow, including:

a separator means for receiving the incoming gas and liquid flow and separating the gas and the liquid;

a first outlet at the upper portion of the separator through which the separated gas may be withdrawn;



a throttling control valve connected to the first outlet for controlling the flow of the gas from the separator;

a second outlet at the lower portion of the separator from which the separated liquids may be withdrawn;

elongated accumulator means in fluid communication with the second outlet of the separator for receiving and temporarily storing the separated liquids;

a movable free piston means positioned in the elongated accumulator means;

means with a second control valve therein providing fluid communication between the downstream side of the elongated accumulator means and the output of the throttling control valve;

said elongated accumulator means being positioned with respect to the separator such that the hydraulic head of the separated liquids above the movable free piston causes accumulating liquids to undergo some movement downstream into the elongated accumulator means;

means for controlling the operation of the throttling control valve and the second control valve whereby a selected pressure differential may be established across the level of the liquid in the separator and the downstream side of the movable free piston to cause the accumulating liquids and the free piston to move downstream into the accumulator means; and

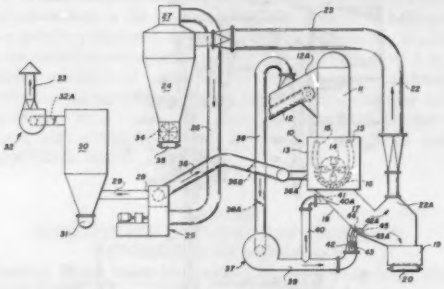
means for supplying gas under pressure into the accumulator means to force the liquid stored therein out of the accumulator means after a selected quantity of liquid has been accumulated in the accumulator means.

4,160,653

FLUID BED SEPARATOR APPARATUS FOR PROCESSING WASTE MATERIAL TO RECOVER BURNABLES

Robert M. Williams, 16 La Hacienda, Ladue, Mo. 63124

Filed Mar. 27, 1978, Ser. No. 890,042
Int. Cl.[2] C02C *1/18*
U.S. Cl. 55—315 **8 Claims**



1. Fluid bed separator apparatus for processing waste material to recover burnables comprising: a hammer mill having a feed hopper forming an inlet and an elutriating chamber forming an outlet; an air lift column having an inlet connected into said elutriating chamber; a cyclone separator having an inlet connected to said air lift column; a blower having an inlet connected to said cyclone separator and a delivery outlet; conduit means connected between said blower delivery outlet and said hammer mill; a bag house having an inlet connected to said blower delivery outlet; and a fan connected to said bag house to exhaust air to atmosphere and maintain a pressure in said elutriating chamber less than ambient pressure, said blower creating an air flow through said hammer mill and in by-pass of said hammer mill, whereby said material in said hammer mill and elutriating chamber is subject to air movement flowing from said feed hopper to said air lift column.

4,160,654

METHOD FOR MAKING SILVER-CONTAINING GLASSES EXHIBITING THERMOPLASTIC PROPERTIES AND PHOTOSENSITIVITY

Roger F. Bartholomew, Painted Post; Joseph F. Mach, Corning, and Che-Kuang Wu, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,783
Int. Cl.[2] C03C *15/00, 21/00*
U.S. Cl. 65—30 E **22 Claims**

1. A method for making a transparent, essentially colorless glass body exhibiting thermoplastic properties wherein at least a surface portion thereof contains Ag^+ ions which comprises melting a batch for an anhydrous glass body consisting essentially, in mole percent on the oxide bases, of about 3–25% Na_2O and/or K_2O, 50–95% SiO_2, up to 25% of at least one oxide selected from the group of BaO, B_2O_3, CaO, PbO, and ZnO, up to 35% MgO, up to 20% Al_2O_3, and up to 10% Li_2O, and then contacting said anhydrous glass body in thickness dimensions no greater than about 5 mm. with an aqueous solution environment containing Ag^+ ions having a pH less than about 4, the oxidation state of the glass being controlled in both the batch composition and in said aqueous solution environment, said oxidation state of said aqueous solution environment being controlled by including an oxidizing agent therein, this contact being made at a temperature in excess of 100° C. and at a pressure in excess of 20 psig for a period of time

sufficient to hydrate at least a surface portion on said glass body having an amount of H_2O absorbed therein effective to impart thermoplastic properties thereto and to cause the replacement of Na^+ and/or K^+ ions with Ag^+ ions in said hydrated glass, the proportion of Na^+ and/or K^+ ions in said hydrated glass being less with a corresponding increase in Ag^+ ions.

7. A method for making a transparent, essentially colorless glass body wherein at least a surface portion thereof exhibits thermoplastic properties and wherein at least said surface portion thereof contains Ag^+ ions which comprises the steps of:

(a) melting a batch for an anhydrous glass body consisting essentially, in mole percent on the oxide basis, of about 3–25% Na_2O and/or K_2O, 50–95% SiO_2, up to 25% of at least one oxide selected from the group of BaO, B_2O_3, CaO, PbO, and ZnO, up to 35% MgO, up to 20% Al_2O_3, and up to 10% Li_2O;

(b) hydrating said anhydrous glass body by exposing said body to a H_2O-containing gaseous atmosphere having a relative humidity of at least about 75% at a temperature of at least about 100° C. for a period of time sufficient to develop at least a surface portion which is essentially saturated with H_2O;

(c) dehydrating said body through contact thereof with a gaseous environment wherein the relative humidity is less than about 90% of that employed in said hydration step for a period of time sufficient to reduce the water content at least within said surface portion but leaving an amount therein effective to impart thermoplastic properties thereto; and then

(d) contacting said hydrated glass body with an aqueous solution environment containing Ag^+ ions having a pH less than about 5, this contact being made at a temperature in excess of 100° C. for a period of time sufficient to cause the replacement of Na^+ and/or K^+ ions in said hydrated glass with Ag^+ ions, the proportion of Na^+ and/or K^+ ions in said hydrated glass being less with a corresponding increase in Ag^+ ions, the oxidation state of the glass being controlled in both the batch composition and in said aqueous solution environment, said oxidation state of said aqueous solution being controlled by including an oxidizing agent thereof.

4,160,655

PROCESS FOR MAKING GRADIENT PHOTOCHROMIC GLASS ARTICLES

Paul I. Kingsbury, Jr., Elmira, and Thomas P. Seward, III, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,962

Int. Cl.[2] C03K *15/00*; C03B *31/00*

U.S. Cl. 65—30 R **4 Claims**

1. A process for producing a gradient photochromic glass article by the selective over-nucleation of a limited portion of the glass article which essentially comprises the steps of:

(a) subjecting a selected limited portion of a potentially photochromic glass article containing silver and a halogen selected from the group consisting of chlorine, bromine and iodine to a nucleation heat treatment at a temperature above the minimum temperature necessary for the development of nuclei for silver halide growth in the glass but below the minimum temperature required for the growth of photochromic silver halide particles in the glass, for a time at least sufficient to reduce the photochromic development potential of said selected limited portion, in order to obtain the selective over-nucleation of said portion, while maintaining the remainder of the glass article at a temperature below the minimum temperature necessary for the development of nuclei for silver halide growth therein; and

(b) subjecting the entire potentially photochromic glass article to a photochromic development heat treatment at a temperature above the minimum temperature sufficient to permit the growth of silver halide crystallites in the glass for a time at least sufficient to develop photochromic properties in the remaining portion of the glass article not subjected to selective over-nucleation.

4,160,656

PROCESS FOR DEODORIZING LIQUID MANURE AND REMOVING HARMFUL GASES

Helmut Junkermann, Frankfurt, Fed. Rep. of Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,111

Claims priority, application Fed. Rep. of Germany, May 26, 1977, 2723753

Int. Cl.[2] C05F *3/00*; C05C *9/00*; C02B *1/34*

U.S. Cl. 71—21 **15 Claims**

1. A process for deodorizing liquid manure and removing harmful gases therefrom comprising applying to the liquid manure formaldehyde and a peroxy compound in the weight ratio of formaldehyde (100 weight % basis) and peroxy compound (100 weight % basis) of 1:3 to 3:1.

4,160,657

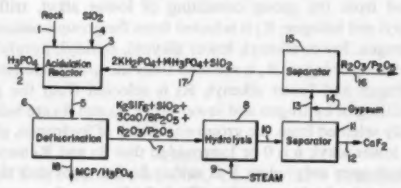
PREPARATION OF MONOCALCIUM PHOSPHATE AND PHOSPHORIC ACID

Erhart K. Drechsel, Houston, Tex., assignor to Pennzoil Company, Shreveport, La.

Continuation-in-part of Ser. No. 870,814, Jan. 19, 1978, which is a division of Ser. No. 608,973, Aug. 29, 1975, Pat. No. 4,086,322, which is a continuation-in-part of Ser. No. 512,877, Oct. 7, 1974, abandoned. This application Aug. 2, 1978, Ser. No. 930,147

Int. Cl.[2] C05B *11/10*

U.S. Cl. 71—41 **15 Claims**



1. A process for the production of monocalcium phosphate and phosphoric acid which comprises acidulating phosphate rock with an excess of phosphoric acid in the presence of added silicon dioxide and potassium ion to produce a first slurry of insoluble potassium fluosilicate in a solution of monocalcium phosphate in phosphoric acid; subjecting this mixture to separation to produce a clarified solution of monocalcium phosphate in phosphoric acid and a second slurry comprising monocalcium phosphate in phosphoric acid which contains insoluble potassium fluosilicate; subjecting said second slurry to hydrolysis at an elevated temperature to regenerate a KH_2PO_4/H_3PO_4 solution and produce calcium fluoride and silicon dioxide; recovering the calcium fluoride and silicon dioxide and recycling the KH_2PO_4/H_3PO_4 solution to the acidulation reaction.

4,160,658

SUBSTITUTED BENZOTHIAZOLINES AND THEIR USE AS PLANT GROWTH REGULANTS

John J. D'Amico, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

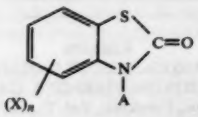
Division of Ser. No. 735,658, Oct. 26, 1976, Pat. No. 4,075,216. This application Oct. 6, 1977, Ser. No. 839,875

Int. Cl.[2] A01N *5/00*

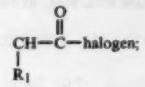
U.S. Cl. 71—90 **39 Claims**

1. A composition for regulating the growth of soybean

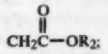
plants consisting essentially of a compound having the formula



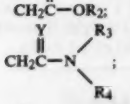
wherein A is selected from the group consisting of



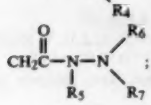
(I)



(II)



(III)



(IV)

wherein R_1 is selected from the group consisting of hydrogen and lower alkyl; X is halogen; Y is selected from the group consisting of oxygen and sulfur; R_2 is selected from the group consisting of lower alkenyl, monohalo lower alkenyl, dihalo lower alkenyl, trihalo lower alkenyl, lower alkynyl, benzyl and benzyl optionally substituted by up to three substituents selected from the group consisting of lower alkyl, trifluoromethyl and halogen; R_3 is selected from the group consisting of hydrogen, lower alkenyl, lower alkynyl, pyridyl, pyridyl substituted by halogen; R_4 is selected from the group consisting of hydrogen and lower alkenyl; R_5 is selected from the group consisting of hydrogen and lower alkyl; R_6 and R_7 are independently selected from the group consisting of hydrogen, phenyl and lower alkyl; n is 0 or 1; provided that R_3 and R_4 may both be hydrogen only when Y is sulfur; further provided that R_6 may not be hydrogen when R_7 is hydrogen; the remaining parts being composed of one or more suitable diluents, carriers and/or adjuvants.

4,160,659

SYNERGISTIC HERBICIDAL COMPOSITIONS

James E. Rodebush, Three Forks, Mont., and Gerald H. Thiele, Sunnyvale, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 27, 1978, Ser. No. 890,340
Int. Cl.[2] A01N *9/22, 9/28*
U.S. Cl. 71—95 **2 Claims**

1. A synergistic herbicidal composition consisting essentially of a mixture of

(1) a herbicidally effective amount of 1-allyl-3-chloro-4-chloromethyl-2-pyrrolidone and

(2) a herbicidally effective amount of 2-ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranyl methanesulfonate, in a weight ratio of (1) to (2) of 0.1–8:1.

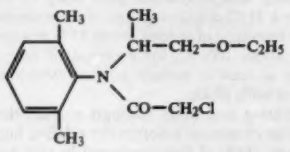
4,160,660

ACETANILIDE PLANT GROWTH REGULATING AGENT

Christian Vogel, Binningen, and Rudolf Aebi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 814,257, Jul. 11, 1977, abandoned, which is a continuation of Ser. No. 688,865, May 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 548,041, Feb. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 328,202, Jan. 31, 1973, abandoned. This application May 15, 1978, Ser. No. 905,835
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.[2] C07C *103/375*; A01N *9/20*
U.S. Cl. 71—118 **4 Claims**

1. The compound 2-chloro-2',6'-dimethyl-N-(1-ethoxyprop-2-yl)-acetanilide of the formula



2. A plant growth regulating agent containing as active substance an effective amount of the compound according to claim 1, together with an inert carrier therefor.

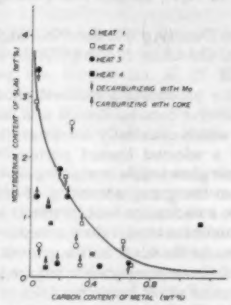
3. A method of selectively combating undesirable plant growth in cultivated plants, which comprises applying to the area to be treated an effective amount of the compound according to claim 1.

4,160,661

PROCESS FOR THE PRODUCTION OF FERROMOLYBDENUM IN AN ELECTRIC ARC FURNACE

Robert J. Brigham; Guy V. Sirianni, and Andrew Garner, all of Ottawa, Canada, assignors to Placer Development Limited, Vancouver, Canada

Filed May 3, 1978, Ser. No. 902,427
Claims priority, application Canada, Dec. 23, 1977, 293919
Int. Cl.[2] C21C *5/52*
U.S. Cl. 75—12 **11 Claims**



1. A process for the production of a ferromolybdenum alloy having a molybdenum content of at least 50% by weight and a carbon content not exceeding 0.1% by weight with a high recovery of molybdenum which process comprises introducing into a melt containing iron in a furnace, a charge of a molybdenum oxide concentrate, a carbonaceous reductant for said concentrate and a source of lime, said molybdenum oxide concentrate being charged in an amount to provide the re-

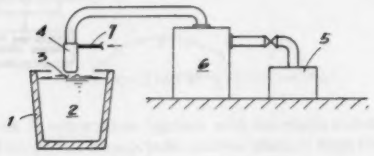
quired concentration of molybdenum in the alloy and the carbon reductant being charged in an amount to cause reduction of the molybdenum oxide concentrate, simultaneously smelting said charge in said melt to form a molten ferromolybdenum alloy bath with a slag covering said bath, adding a carbonaceous material to said slag in an amount sufficient to cause a substantial proportion of molybdenum contained in said slag to be stripped therefrom and pass into said bath, and recovering molten ferromolybdenum alloy from said bath not exceeding 0.1% by weight of carbon.

4,160,662

METHOD FOR THE REMOVAL OF SCUM

Katsumi Nagasaki, Sakai; Yoshihiro Inoue, Nishinomiya; Hiroyuki Yamazaki, Amagasaki; Akifumi Yano, Osaka, and Tetsuo Momose, Hirakata, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jun. 8, 1977, Ser. No. 804,530
Claims priority, application Japan, Jun. 11, 1976, 51/69234
Int. Cl.[2] C21B *3/04*
U.S. Cl. 75—24 **10 Claims**



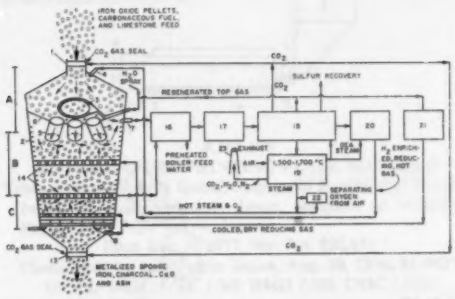
1. A method of removing slag-like scum floating on the surface of a molten material comprising positioning a suction head above the surface of said scum, forming a tubular gaseous stream directed from the suction head toward the surface of said scum, and removing said scum by applying negative pressure through the suction head to the interior space surrounded by the tubular gaseous stream to cause the removal of said scum through said interior space and suction head.

4,160,663

METHOD FOR THE DIRECT REDUCTION OF IRON ORE

Jack Hsieh, Rte. 2, Box 15-c, Richland, Wash. 99352

Filed Feb. 21, 1978, Ser. No. 879,250
Int. Cl.[2] C21B *13/02*
U.S. Cl. 75—35 **10 Claims**



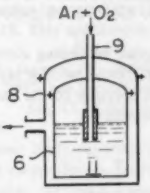
1. A method for the direct reduction of iron ore comprising
(a) introducing said iron ore together with solid carbonaceous material, steam, burner gas and hot oxygen, substantially free of inert gases, into a gasification and initial reduction zone in the upper portion of a fixed vertical shaft furnace, controlling the admission of oxygen, steam and burner gas so as to maintain a temperature such as to cause partial combustion and pyrolysis of said carbonaceous material and reaction thereof with said steam to produce a reducing gas comprising carbon monoxide and hydrogen and initiate the reaction between said reducing gas and said ore,
(b) flowing said iron ore, carbonaceous material and reducing gas downwardly through restricted passages into a final reduction zone,
(c) introducing a hot mixture of steam and hydrogen-enriched carbon monoxide into a middle portion of said final reduction zone,
(d) flowing said iron ore and said carbonaceous material downwardly through said final reduction zone while maintaining a temperature in said final reduction zone below the melting point of metallic iron, ash and other solid constituents, but sufficiently high to cause reduction of said iron ore to sponge iron,
(e) flowing said sponge iron downwardly into a cooling zone,
(f) introducing a cool, dehumidified reducing gas comprising carbon monoxide and hydrogen into a lower portion of said cooling zone,
(g) drawing top gas from an upper and a lower portion of said final reduction zone at rates such as to cause reducing gas to flow downwardly from said gasification and initial reduction zone, upwardly and downwardly from said middle portion of said final reduction zone, and upwardly through said cooling zone,
(h) withdrawing cooled sponge iron downwardly from said cooling zone.

4,160,664

PROCESS FOR PRODUCING ULTRA-LOW CARBON STAINLESS STEEL

Shigeaki Maruhashi, and Yoshio Kobayashi, both of Tokuyama, Japan, assignors to Nisshin Steel Co. Ltd., Tokyo, Japan

Filed Jan. 13, 1978, Ser. No. 869,124
Claims priority, application Japan, Jan. 25, 1977, 52-6405
Int. Cl.[2] C21C *7/10*
U.S. Cl. 75—49 **10 Claims**



1. A process for producing an ultra-low carbon stainless steel which comprises preparing a molten metal melt of low carbon stainless steel by top-blowing an oxidizing gas onto the surface of said molten metal contained in a vessel under reduced pressure, and while maintaining said molten metal under reduced pressure, blowing a mixed gas of an oxidizing gas and an inert gas into the low carbon stainless steel molten metal through a lance immersed in the melt.

4,160,665

NICKEL-BASE ALLOY

Kuzma I. Terekhov, Maly Pionersky pereulok, 5, kv. 44; Alexei T. Tumanov, B. Gruzinskaya ulitsa, 36, kv. 58; Ljudmila S. Markina, ulitsa Krasna Kazanets, 19, korpus 1, kv. 119; Klavdia A. Okolelova, Krasnoprudnava ulitsa, 7/9 kv. 181; Alexandr F. Belov, Leninsky prospekt, 66, kv. 114; Nikolai D. Bobovnikov, Savvinskaya naberezhnaya, 3 kv. 170; Fedor V. Tulyankin, ulitsa Zaporozhskaya, 2, kv. 49; Petr A. Zasetsky, ulitsa 26 Bakinskikh Komissarov, 7, korpus 3, kv. 24, all of Moscow; Vladimir N. Zhuchin, ulitsa Koreshkova, 10 kv. 10; Mikhail Y. Dzugutov, ulitsa Mira, 4, kv. 37, both of Elektrostal; Mikhail S. Podolsky, Profsojuznaya ulitsa, 52 korpus 2, kv. 35, Moscow, and Valentin V. Topilin, ulitsa Mira, 6, kv. 29, Elektrostal, all of U.S.S.R.

Continuation of Ser. No. 347,492, Apr. 3, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 817,531

Int. Cl.[2] C22C *19/05*

U.S. Cl. 75—171 3 Claims

1. A nickel-base alloy consisting of the following components in weight percent: 0.04–0.08 carbon; 13–16 chromium; 2.3–3.0 titanium; 1.8–3.0 aluminum; 2.2–6.0 niobium; 6–12 cobalt; 4–8 molybdenum; 0.001–0.1 lanthanum; 0.001–0.01 boron; 0.001–0.03 cerium and the balance-nickel.

4,160,666

POLYMERIC CHEMICAL SENSITIZERS FOR ORGANIC PHOTOCONDUCTIVE COMPOSITIONS

John M. McCabe, and William E. Yoerger, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 25, 1977, Ser. No. 800,594

Int. Cl.[2] G03G *5/06, 5/09*

U.S. Cl. 96—1 PC 38 Claims

1. A photoconductive insulating composition comprising an organic photoconductor chemically sensitized with a polymer comprising repeating units to which are appended a monovalent chlorendate radical.

4,160,667

ALUMINUM CHELATES AS ACCEPTOR TYPE SENSITIZERS AND PLASTICIZERS FOR PHOTOCONDUCTIVE POLYMERS

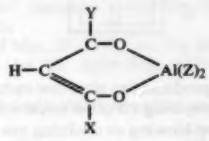
James M. Halm, Lombard, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Jun. 22, 1977, Ser. No. 808,858

Int. Cl.[2] G03G *5/09, 5/04*

U.S. Cl. 96—1.5 R 9 Claims

1. An electrophotographic recording element comprising a conductive base support coated with a layer comprising an organic photoconductive polymer of the electron donor type and a sensitizer of the formula:



where X and Y each independently is a member selected from the group consisting of alkyl, aryl, electron withdrawing alkyl and electron withdrawing aryl and Z is a member selected from the group consisting of fluoro and phenyl.

4,160,668

ELECTROPHOTOGRAPHIC GRADE ZINC OXIDE

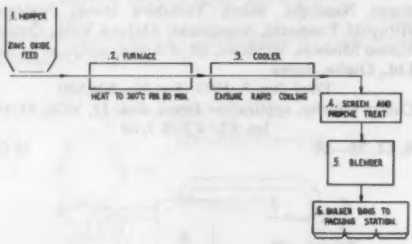
Paul J. Christesen, Annandale, and Geoffrey R. Sanders, Rowville, both of Australia, assignors to The Broken Hill Proprietary Company Limited and The Lysaght Durham Chemical Company Proprietary Limited, both of Victoria, Australia

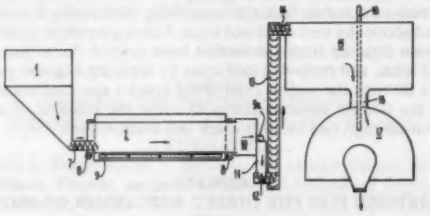
Continuation of Ser. No. 674,724, Apr. 6, 1976, abandoned. This application Aug. 11, 1977, Ser. No. 823,847

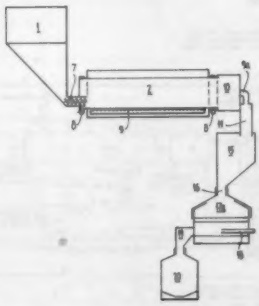
Claims priority, application Australia, Apr. 11, 1975, 1202/75

Int. Cl.[2] G03G *5/08;* H01C *13/00;* G01G *9/02*

U.S. Cl. 96—1.8 23 Claims







1. A process for the production of electrophotographic grade zinc oxide which comprises heating zinc oxide to a temperature of between 150° C. and 800° C., cooling the zinc oxide to a temperature below 100° C., and then treating the heat treated, cooled zinc oxide with an organic compound in the gaseous phase by contacting the gas with the zinc oxide at a temperature not exceeding 100° C., said organic compound being selected from the group consisting of propene, butene, pentene and isoprene.

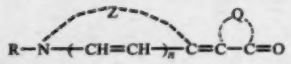
4,160,669

ARGON LASER FLASH EXPOSURE OF SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC MATERIAL

Teiji Habu, 3-31-8, Higashi, Kunitachi-shi, Tokyo; Tomio Nakajima, 3-12-4, Shin-machi, Setagaya-ku, Tokyo; Eiichi Sakamoto, 5-12, Hon-cho, Hanno-shi, Saitama-ken; Noboru Fujimori, 729, Misawa, Hino-shi, Tokyo, and Kiyomitsu Mine, 7775, Hino, Hino-shi, Tokyo, all of Japan

Continuation of Ser. No. 666,455, Mar. 12, 1976, abandoned. This application Feb. 9, 1978, Ser. No. 876,560
Claims priority, application Japan, Mar. 17, 1975, 50-32004
Int. Cl.[2] G03C 5/04
U.S. Cl. 96—27 E 9 Claims

1. A process for forming an image by use of a silver halide photographic material comprising a silver halide photographic emulsion layer to be used for argon laser beam exposure which process comprises imagewise exposing the photographic material to argon laser beam light for 10^{-5} to 10^{-7} second, and developing said material said photographic emulsion layer comprising at least one sensitizing dye represented by the following formula:



wherein Z, when taken together with the atoms to which it is attached, form a heterocyclic nucleus selected from the group consisting of a pyridine nucleus, a pyrroline nucleus, an oxazole nucleus, a thiazole nucleus and a selenazole nucleus, said nuclei having a substituent or substituents selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and aryl or said nuclei are fused with a benzene or naphthalene ring which ring can have a substituent or substituents selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and halogen; Q, when taken together with the atoms to which it is attached, form a heterocyclic nucleus selected from the group consisting of a rhodanine nucleus, a thiohydantoin nucleus, a thiooxazolidinedione nucleus and a thioselenazolidinedione nucleus, said nuclei having a substituent or substituents selected from the group consisting of lower alkyl, lower alkoxy, sulfoalkyl, carboxyalkyl, hydroxyalkyl, allyl and aryl; R is selected from the group consisting of alkyl, alkenyl, aryl, substituted alkyl wherein said substituent is selected from the group consisting of β-hydroxyethyl and β-carboxyethyl; and n is an integer of 0 or —1.

4,160,670

LITHOGRAPHIC PRINTING PLATE MATERIAL

Yasuo Tsubai; Shigeru Iguchi; Shigeyoshi Suzuki, and Tamotsu Iwata, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 5, 1977, Ser. No. 822,191
Claims priority, application Japan, Aug. 10, 1976, 51-95276
Int. Cl.[2] G03C 5/54, 1/48; B44D 1/09; C03C 17/06
U.S. Cl. 96—119 R 22 Claims

1. A lithographic printing plate element using silver complex diffusion transfer process, characterized in that at least one of a layer which contains nuclei for physical development comprising a heavy metal or a sulfide thereof and a layer adjacent to said layer contain a polyfunctional synthetic polymer containing 1 to 20 mole % of functional groups having an affinity to said nuclei and being characterized by having affinity for colloidal heavy metal or a sulfide thereof and 5 to 99 mole % of functional groups providing hydrophilic properties.

4,160,671

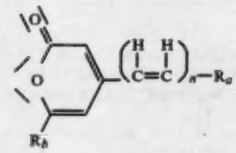
PHOTOSENSITIVE COMPOSITION

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

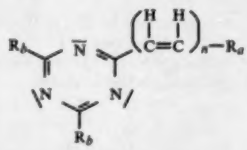
Filed Sep. 9, 1977, Ser. No. 831,935
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641100
Int. Cl.[2] G03C 1/52
U.S. Cl. 96—91 D 6 Claims

1. A photosensitive composition comprising an ester or an amide of an o-naphthoquinone diazide sulfonic or carboxylic acid and, based on the amount of this compound, about 1 to 50 percent by weight of an organic dye capable of salt formation and selected from the group consisting of triphenylmethane, azine or anthraquinone dyes, and about 5 to 75 percent by weight of a photosensitive halogen-containing compound which releases acid upon exposure to light and having one of the general formulae I or II

I



II



in which

R_a is an aryl group or a heterocyclic group which may be substituted,

R_b is a trihaloalkyl group or a trihaloalkenyl group having from 1 to 3 carbon atoms and

n is 1, 2 or 3.

4,160,672

GLASS-CERAMICS FOR SEMICONDUCTOR DOPING

James E. Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 535,170, Dec. 23, 1974, Pat. No. 3,961,969, which is a continuation-in-part of Ser. No. 431,212, Jan. 7, 1974, Pat. No. 3,907,618. This application Feb. 18, 1976, Ser. No. 658,970
The portion of the term of this patent subsequent to Sep. 23, 1992, has been disclaimed.
Int. Cl.[2] C03C 3/22
U.S. Cl. 106—39.6 2 Claims

1. A glass-ceramic body resulting from the in situ thermal crystallization of a thermally crysytallizable substantially alkali metal oxide free glass having a composition in mole percent consisting essentially of SiO_2 15–40, Al_2O_3 15–30, B_2O_3 20–60, RO 5–25, La_2O_3 0–5, Nb_2O_5 0–5 and Ta_2O_5 0–5, wherein

RO is one or more of MgO, CaO, SrO and BaO in the following mole percentages:

MgO:0–15
CaO:0–10
SrO:0–10
BaO:0–15 and

wherein the ratio Al_2O_3/RO is 1.5–4.

4,160,673

LOW TEMPERATURE CALCINED PORCELAIN AND PROCESS FOR PREPARATION THEREOF

Toshio Fujita, Nagoya, and Hironaga Teratani, Owariasahi, both of Japan, assignors to Nippon Kouatsu Electric Co., Japan

Filed Dec. 30, 1977, Ser. No. 865,947
Claims priority, application Japan, Jan. 13, 1977, 52-2706; Oct. 5, 1977, 52-119767
Int. Cl.[2] C04B 33/24, 33/26
U.S. Cl. 106—45 10 Claims

1. A low temperature calcined porcelain consisting essentially of (a) about 40 to about 60% weight of pulverized waste glass, (b) about 10 to about 30% weight of aluminum oxide, (c) about 10 to about 25% weight of a fine alumina-silicate substance having a high plasticity, and (d) about 5 to about 15% weight of phosphoric acid and/or phosphate, and further, optionally, up to about 5% weight of a metal oxide as a coloring agent, the calcining temperature being in the range of from about 650° to 750° C.

4,160,674

EARLY HIGH-STRENGTH PORTLAND CEMENT AND METHOD OF MANUFACTURE

James L. Sawyer, Friendswood, Tex., assignor to Lone Star Industries, Houston, Tex.

Filed Jan. 30, 1978, Ser. No. 873,308
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—89 12 Claims

1. An early high-strength cement having substantially all of its particles of a size of 20 microns and smaller,
the cement having setting and volume change characteristics normal for and typical of portland cement.

4,160,675

PROCESS FOR PURIFYING AN AQUEOUS SOLUTION

Wilhelmus Pannekeet, Haarlem, and Robert Smakman, Nigtevecht, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Sep. 12, 1977, Ser. No. 832,126
Claims priority, application Netherlands, Sep. 17, 1976, 7610396
Int. Cl.[2] C13D 3/12, 3/14
U.S. Cl. 127—46 A 14 Claims

1. A process for removing an organic impurity from an aqueous solution consisting essentially of sequentially contacting the aqueous solution with an acid cation exchanger and subsequently with a polymer or polycondensate, which contains sulfur in the form of thiol groups bonded to carbon atoms.

4,160,676

METHOD OF FORMING A COMPOSITE ROD

Walter I. Waldrop, P.O. Box 19042, Houston, Tex. 77024; Roy Waldrop, and Cyrus Paul, both of Houston, Tex., assignors to Walter I. Waldrop, Houston, Tex.

Filed Aug. 17, 1978, Ser. No. 934,393
Int. Cl.[2] B22D 23/06, 19/02; B08B 7/00
U.S. Cl. 134—6 14 Claims

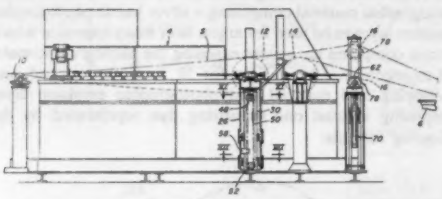
1. A method of forming a composite rod having a matrix bonding tungsten carbide particles comprising the steps of:
a. washing the tungsten carbide particles;
b. placing a quantity of the carbide particles in a graphite mold;
c. heating the mold and particles to a range of about 300° to about 500° F. and pouring a water solution of flux in the mold while maintaining the temperature in the range of about 300° to about 500° F. whereby the water boils off and the flux coats the surfaces of the carbide particles;
d. placing a matrix in the mold; and
e. applying multi-flames to the mold and carbide particles while stirring the particles in the mold with a graphite rod to assist in intimate contact and commingling of the carbide particles and matrix to effect bonding of the matrix with the carbide particles to form the composite rod.

4,160,677

METHOD OF PROCESSING ALLOY STEEL STRIP

Frederick S. Lukac, New Kensington, and William P. Zbryski, Tarentum, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 769,497, Feb. 17, 1977, Pat. No. 4,119,109. This application Feb. 27, 1978, Ser. No. 881,967
Int. Cl.[2] B08B 7/04
U.S. Cl. 134—9 1 Claim



1. The method of processing alloy steel strip of various types which comprises passing one length of alloy steel strip of a first type continuously through a heat treating line, then through a molten salt bath in a tank with said length passing through the molten salt bath beneath and contacting a driven sink roll positioned in said tank, then above and in spaced apart relationship with a guide roll, covering said guide roll while said strip leaving the salt bath is passing over said guide roll, then passing said length through a rinse tank, then through a pickling bath, fastening the trailing end of said one length of alloy steel strip to the leading end of another length of alloy steel strip, continuing the above steps until a last length of alloy steel of the first type is being processed and an alloy steel strip of a second type which is not to be subject to the salt bath is to be processed, then fastening the leading end of a length of the second type of alloy steel strip to the trailing end of the last length of the first type of alloy steel strip, then raising said sink roll and its drive above said salt bath so that the second type of alloy steel strip will bypass the salt bath, uncovering said guide roll and raising said guide roll to contact said second type of alloy steel strip bypassing said molten salt bath, and continuing said processing with the sink roll being in raised or lowered position according to the type of alloy steel being treated, and with said guide roll being raised and uncovered or lowered and covered according to the type of alloy steel being treated.

4,160,678

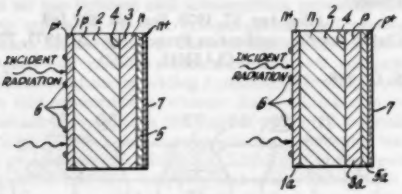
HETEROJUNCTION SOLAR CELL

Faquir C. Jain, 16 Northwood Apartments, Stoors, Conn. 06268, and Mahmoud A. Melehy, P.O. Box 409, R.F.D. #1, Baltic, Conn. 06330

Continuation of Ser. No. 717,158, Aug. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 537,416, Dec. 30, 1974, abandoned. This application Apr. 6, 1978, Ser. No. 893,967
Int. Cl.[2] H01L 31/06
U.S. Cl. 136—89 SJ 3 Claims

1. A semiconductor solar cell comprising a window region of a semiconductor material of one conductivity type and having a given energy gap, a collector region of a different semiconductor material of a narrower energy gap and of an opposite conductivity type to said window region, said collector region forming a p-n heterojunction at its interface with said window region, the impurity concentration of an inner region of said window region adjacent to said heterojunction being less than half that of the portion of said collector region

adjacent said heterojunction, said window region further including an outer window region spaced from said heterojunction and being of a greater conductivity than that of said inner window region.



4,160,679

MIGRATION OF FINE LIQUID WIRES BY THERMAL GRADIENT ZONE MELTING THROUGH DOPED SURFACES

Douglas E. Houston, Ballston Lake; Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,904
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—1.5 **9 Claims**

1. In the method of moving a melt of metal-rich semiconductor material through a solid body of semiconductor material by thermal gradient zone melting processing comprising the step of

a. selecting a body of single crystal semiconductor material so that the body has a first type conductivity, a selected resistivity, and at least one of two major opposed surfaces having a preferred planar crystal structure orientation which is one selected from the group consisting of (100), (110) and (111), the vertical axis of the body being substantially aligned with a first axis of the crystal structure, the surface having the preferred planar crystal structure orientation to accommodate one or more physical configurations of a layer of metal thereon;

b. depositing a layer of metal on the selected surface of the body of semiconductor material;

c. heating the body and the layer of metal to a temperature sufficient to form a melt of metal-rich material on the surface of the body;

d. establishing a temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure, and

e. migrating the metal-rich melt through the body parallel to the vertical axis of the body to form within the body at least one region of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the metal including at least one dopant impurity material therein to impart a second type conductivity and a selected level of resistivity thereto;

the improvement in the method of processing which includes prior to depositing the layer of metal on the selected surface the additional process step of forming a region in the body to increase the emissivity of the radiant energy in that portion of the body including the region, and to maintain the unidirectional thermal gradient to be established in the body normal to the selected surface in that region of the body, including the selected surface thereof on which the layer of metal is to be deposited, the region extending a predetermined depth into the body from the selected surface to provide a minimum thickness thereto and having a predetermined level of concentration of a dopant impurity material therein.

4,160,680

VACUUM CARBURIZING

Russell F. Novy, Northbrook; Gerald L. Scott, Glenview, and Thomas O. Zurfluh, Chicago, all of Ill., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Continuation of Ser. No. 739,105, Nov. 5, 1976, abandoned, which is a continuation of Ser. No. 553,594, Feb. 27, 1975, abandoned. This application Apr. 18, 1978, Ser. No. 897,414
Int. Cl.[2] C21D *1/06*
U.S. Cl. 148—16.5 **11 Claims**

1. The method of subatmospheric gaseous carburizing or carbonitriding workpieces in a load chamber within a vacuum furnace comprising the steps of placing a load of the workpieces to be carburized in the load chamber, sealing said furnace and evacuating said chamber to a first subatmosphric pressure for removing most of the air and adsorbed gases and surface contaminants from the workpieces, then bringing said workpieces up to treatment temperature in the range of 1500° F. to 1900° F., holding said workpieces for a sufficient time period at said treatment temperature and at said first subatmospheric pressure for temperature stabilization throughout the load, back filling carburizing gaseous treatment material into said furnace until the pressure in said chamber has been raised to a second subatmospheric pressure greater than said first subatmospheric pressure while maintaining said treatment temperature within said chamber, said treatment temperature being that temperature within the range of 1500° F. to 1900° F. at which the carburizing gaseous treatment material will carburize the workpieces, positively uniformly circulating said gaseous treatment material through the load of workpieces in the load chamber by a hot circulating fan within said furnace, said second subatmospheric pressure being at least 300 torr absolute for enabling the hot circulating fan to effectively circulate said gaseous treatment material in said furnace throughout said load of workpieces in said load chamber, at said second subatmospheric pressure providing an input flow of the gaseous treatment material into said furnace at a predetermined constant flow rate and adjusting the output pumping from said furnace for holding the pressure in said chamber at said second subatmospheric pressure which is at least 300 torr absolute, continuously circulating the gaseous treatment material through the load by the hot circulating fan, and continuing for the desired carburizing time said treatment temperature, said input flow, said output pumping, and said uniform circulating by the hot circulating fan.

4,160,681

SILICON STEEL AND PROCESSING THEREFORE

Clarence L. Miller, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 27, 1977, Ser. No. 864,363
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—111 **14 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, which process includes the steps of: preparing a melt of silicon steel containing from 0.02 to 0.06% carbon, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, no more than 0.008% aluminum and from 2.5 to 4.0% silicon; casting said steel; hot rolling said steel; cold rolling said steel; decarburizing said steel; applying a refractory oxide coating to said steel; and final texture annealing said steel; the improvement comprising the steps of coating the surface of said steel with a refractory oxide coating consisting essentially of:

(a) 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;

(b) up to 100 parts, by weight of at least one other substance from the group consisting of boron and compounds thereof, said coating containing at least 0.1%, by weight, of boron;

(c) from 0.5 to 50 parts, by weight, of manganese sulfate;

(d) up to 50 parts, by weight, of oxides less stable than SiO_2 at temperatures up to 2150° F., said oxides being of elements other than boron;
(e) up to 40 parts, by weight, of SiO_2;
(f) up to 20 parts, by weight, of inhibiting substances; and
(g) up to 10 parts, by weight, of fluxing agent;
and final texture annealing said steel with said coating thereon; said steel having a permeability of at least 1870 (G/O_e) at 10 oersteds and a core loss of no more than 0.720 watts per pound at 17 kilogauss-60 Hz.

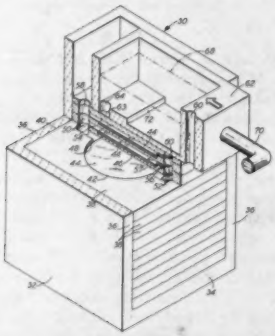
13. Primary recrystallized steel from a melt consisting essentially of, by weight, 0.02 to 0.06% carbon, 0.015 to 0.15% manganese, 0.01 to 0.05% of material from the group consisting of sulfur and selenium, 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, 2.5 to 4.0% silicon, up to 1.0% copper, no more than 0.008% aluminum, balance iron; and having adhered thereto, a coating consisting essentially of:
(a) 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;
(b) up to 100 parts, by weight, of at least one other substance from the group consisting of boron and compounds thereof, said coating containing at least 0.1%, by weight, of boron; and
(c) from 0.5 to 50 parts, by weight, of manganese sulfate.

4,160,682

DEPOSITING MATERIALS ON STACKED SEMICONDUCTOR WAFERS

Werner F. Esseluhn, Wyomissing, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,867
Int. Cl.² H01L *21/208*
U.S. Cl. 148—171 **10 Claims**



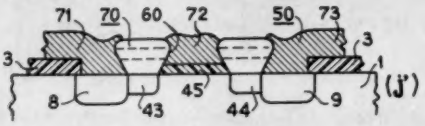
1. A method of depositing epitaxial melt material onto a plurality of semiconductor wafers, comprising:
placing the wafers in a stacked relationship in communication with a common passageway;
filling a reservoir with the material while an aperture in the reservoir is out of alignment with the passageway to prevent the flow of the material out of the reservoir; and
moving the reservoir to align the aperture with the passageway to flow the material through the passageway and onto the stacked wafers.

4,160,683

METHOD OF MANUFACTURING FIELD EFFECT TRANSISTORS OF THE MOS-TYPE

Marcel Roche, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 17, 1978, Ser. No. 897,169
Claims priority, application France, Apr. 20, 1977, 77 11912
Int. Cl.² H01L *21/225*
U.S. Cl. 148—187 **5 Claims**



1. A method of manufacturing field-effect transistor of the MOS-type in one principal surface of a substrate of monocrystalline semiconductor material having a first conductivity type, comprising on the one hand two regions having a second conductivity type opposite to the first, namely a source region and a drain region, respectively, terminating at said surface and separated from one another by an intermediate channel region of the substrate and, on the other hand, a control gate of an electrically conductive material extending above said intermediate region, from which it is insulated by a layer of dielectric material, said method comprising the following steps:
forming a masking layer of silica on the principal surface of the substrate (1) and forming two openings to expose two zones;
diffusing impurities having the second conductivity type through these openings to form a source region (8) and a drain region (9);
removing that portion of the masking silica layer which is present on said intermediate region (12) and forming, by successive deposits over the entire principal surface, a layer (70) of doped silica containing a doping impurity of the second conductivity type, the doping level decreasing with each successive deposit;
removing said layer of doped silica by chemical etching except for two portions situated on the intermediate region respectively adjacent the source and drain regions, said portions decreasing in section in the direction toward said substrate to form a pit;
diffusing impurities into the substrate from said two portions by heating to a temperature of from 950° C. to 1150° C. to form therein two regions (43) and (44) defining the ends of the channel;
forming a layer of dielectric material (45) on the exposed zones of the principal surface during or after this diffusion;
forming a layer (50) of conductive metal over the entire principal surface, said layer having reductions in thickness around said portions; and
removing those portions of said metal layer which are situated above the portions of the layer of doped silica present on said two defining regions (43) and (44) by chemical etching to form source, gate and drain contacts (71), (72), and (73), respectively.

4,160,684

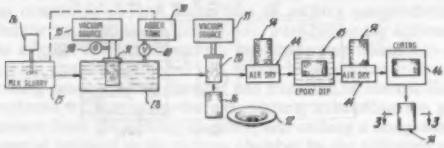
METHOD OF MANUFACTURING A COALESCING DEMISTER

L. Joseph Berger, Jr., and Denis D. Guequiérre, both of Birmingham, Mich., assignors to Finite Filter Company, Madison Heights, Mich.

Continuation-in-part of Ser. No. 593,831, Jul. 7, 1975, Pat. No. 4,078,965. This application Jul. 23, 1976, Ser. No. 708,226
Int. Cl.² B32B *31/00*
U.S. Cl. 156—69 **32 Claims**

1. A method of manufacturing an out-to-in Coalescing Demister including the steps of providing a coalescing subassem-

bly, providing a prefilter-precoalescer subassembly, providing an upper end cap and a lower end cap and potting said coalescing and said prefilter-precoalescer subassemblies concentrically in said upper and said lower end caps with a continuous physical air gap between said subassemblies, providing for a complete separation of said coalescing and said prefilter-precoalescer subassemblies to allow no mechanical transfer of oil between said prefilter-precoalescer and said coalescing subassemblies, and also providing a continuous air flow barrier between said subassemblies, wherein the providing of a coalescer subassembly includes the steps of providing a forming fixture having a removable end cap, placing a perforated inner retainer on said forming fixture and securing it in place with said removable end cap, wrapping said inner retainer with at least one layer of a suitable synthetic cloth to form a lateral channeling filter layer, providing a suitable forming tank with



a suitable glass fiber slurry mix placed therein, providing a suitable vacuum source operatively connected to said forming fixture, lowering said forming fixture into said forming tank and applying a vacuum to the forming fixture in a predetermined manner until a desired thickness of glass fibers are formed over said anti-channeling filter layer, withdrawing said forming fixture from said forming tank, allowing the assembly manufactured thus far to air dry under vacuum for a predetermined period of time, installing an outer perforated retainer tube while said assembly is air drying, shutting off said vacuum, removing said retaining member from said forming fixture and removing said coalescer assembly therefrom, placing said coalescing portion of said coalescing subassembly to air dry, dipping said portion assembly in an epoxy dip after said air drying has taken place, removing said assembly from the epoxy dip and again placing it to air dry, and curing said assembly after the second drying operation has taken place.

4,160,685

METHOD OF MAKING AN APPLIQUE ARTICLE

Minoru Kuroda, Amagasaki, Japan, assignor to Nishizawa Shoji Ltd., Osaka, Japan and The Dimension Weld International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 393,791, Sep. 4, 1973, which is a continuation of Ser. No. 113,088, Feb. 5, 1971, abandoned, which is a continuation-in-part of Ser. No. 662,962, Aug. 24, 1967, abandoned, and a continuation-in-part of Ser. No. 112,403, Feb. 3, 1971, abandoned, which is a continuation of Ser. No. 792,719, Jan. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 662,962, Aug. 24, 1967, abandoned. This application Jan. 7, 1976, Ser. No. 646,960

Claims priority, application Japan, Dec. 19, 1966, 41-83085; Dec. 19, 1966, 41-115532; Dec. 19, 1966, 41-115533; Dec. 19, 1966, 41-115535

The portion of the term of this patent subsequent to Dec. 21, 1988, has been disclaimed.

Int. Cl.[2] **B32B** *31/00*

U.S. Cl. 156—219 **8 Claims**

1. A method of making an adhesive applique article, comprising the steps of providing a base layer of sheet material; providing an adhesive backing on only one surface of said base layer; providing a release layer; providing a cover layer of sheet material having a design surface with an outer contour line, a narrow outer bonding zone along said outer contour line and at least one inner bonding zone spaced inwardly from said outer bonding zone; further providing an intermediate layer of resiliently compressible latently adhesive material having spaces filled with a gaseous medium; forming a sandwich composed of said release layer, said base layer superimposed on said release layer with said adhesive backing thereof in contact with said release layer; said intermediate layer superimposed with one surface thereof on the other surface of said base layer and said cover layer superimposed on the other surface of said intermediate layer; and pressing said cover layer within said outer and inner bonding zones against said intermediate layer and said base layer while activating only said latently adhesive material and thereby bonding said cover layer by said latently adhesive material to said other surface of said base layer in said outer and inner bonding zones, and severing said cover layer and intermediate layer along said outer contour line, the presence of said intermediate layer resulting in formation of a cushion between said base layer and said cover layer in the area surrounded by said outer bonding zone upon bonding of said cover layer to said base layer.

4,160,686

METHOD OF REVERSE COATING TEXTILE SHEETS WITH POLYURETHENE

Georg Niederdellmann, Dormagen; Bernd Quiring, and Wilhelm Thoma, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 838,683

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644923

Int. Cl.[2] **C09J** *5/00*

U.S. Cl. 156—331 **11 Claims**

1. In a method of coating textile sheets by the reversal process with polyurethanes which are stable in storage as solutions according to which the solution of a polyurethane which is substantially free from reactive end groups is applied as top coat to a separating substrate in a first stage of the process, the top coat is dried and in a second stage an adhesive coat solution is applied to the top coat and the textile sheet is laminated thereto, the solvent in the adhesive coat is evaporated off in a second drying operation and the coated textile is subsequently lifted from the separating substrate, the improvement comprising the use of a polyurethane in at least one of the top coat and adhesive coat which has been prepared by the reaction of

(a) at least one dihydroxyl compound having a molecular weight of between about 500 and 5000,

(b) at least one diisocyanate and

(c) a mixture of about 95–35 mol% of at least one diol having a molecular weight of between about 62 and 450 and about 5–65 mol %

of at least one monoalkanolamine having a molecular weight of about 61 to 200, the molar ratio of components (a) to (c) being between about 1:1 and 1:6 thereby giving a coating with improved pressure deformation resistance under heat.

4,160,687

MAGAZINE PAGE LABELING APPARATUS

Phillip L. Spear, Santa Ana, Calif., assignor to Avery International Corporation, San Marino, Calif.

Filed Jun. 26, 1978, Ser. No. 918,728

Int. Cl.[2] **B32B** *3/24*

U.S. Cl. 156—444 **8 Claims**

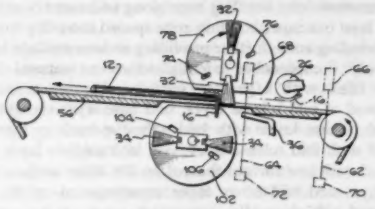
8. An apparatus for applying labels over the rear and the two sides of a high speed moving object comprising:

means for dispensing a label and sticking it onto the back

edge of one side of said object to extend beyond the rear of said object;

means for brushing said label across the rear of said object;

means for directing a jet of air in the direction of travel of



said objects to deflect said label forward over the other side of said object; and

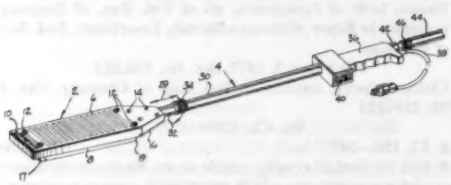
means for brushing said label forward in the direction of movement of said object and for firmly applying said label to the other side of said object.

4,160,688

LOW PROFILE HEAT SEALING IRON

Ray G. Brooks, Irving, Tex., and Harvell M. Smith, Conifer, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 3, 1977, Ser. No. 765,140
Int. Cl.[2] B30B *15/34*; D06F *75/08*
U.S. Cl. 156—574 **6 Claims**



1. A low profile heat sealing iron adapted to be moved along a generally planar surface where access is limited comprising:

(a) a low profile head having a longitudinal axis comprising a cap member having generally planar first and second faces, heating plate means attached to said second face and having a head end and a foot end for heating a thermally activatable strip fed to the head end of said heating plate means for pressing said strip against said generally planar surface as said head is slid along over the length of said strip, and guide means comprising a rectangular slot passing through said cap member from said first face to said second face adjacent the head end of said heating plate means for guiding and feeding said strip to the head end of said heating plate means, and

(b) handle means connected to said low profile head for moving said head along said generally planar surface, said handle means also being of low profile, and said handle means having a longitudinal axis lying substantially in the same plane as said head longitudinal axis.

4,160,689

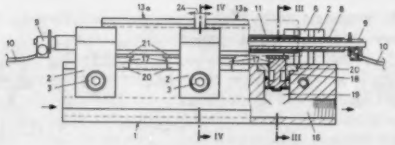
SHEET SEALING SHOE ASSEMBLY

Willy Altermatt, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Rheinfall, Switzerland

Filed Oct. 26, 1977, Ser. No. 845,614
Claims priority, application Switzerland, Nov. 23, 1976, 14727/76
Int. Cl.[2] B30B *15/34*
U.S. Cl. 156—583.1 **12 Claims**

1. In a sealing shoe assembly for forming a seam, by application of heat and pressure, on face-to-face arranged sheets disposed between a backup support and the sealing shoe assembly cooperating with the backup support; the assembly including an elongated carrier and a sealing shoe supported on the carrier; the improvement wherein said sealing shoe is formed of at least two sealing shoe parts arranged on said carrier in longitudinal alignment with respect to one another; each said sealing shoe part having a U-shaped cross section formed of opposite legs and a web portion; each leg of each said sealing shoe part having a longitudinal first projection protruding in the length dimension of the respective sealing shoe part beyond the outline thereof; the improvement further comprising

(a) piston means individually and resiliently movably securing each said sealing shoe part to said carrier; said piston means comprising pistons being in engagement with each said sealing shoe part and being axially slidably supported in said carrier;



(b) means within said carrier for admitting a pressurized medium simultaneously to each said piston for urging each said sealing shoe part towards said backup support;

(c) a plurality of holders attached in a spaced relationship to said carrier; said holders being arranged at the opposite ends of each said sealing shoe part; each holder having a second projection disposed in the path of travel of a respective first projection for limiting the motion of each said sealing part away from said carrier;

(d) a longitudinal heater bar arranged on said carrier in the length dimension thereof and being held by said holders; and

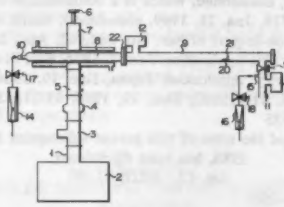
(e) an elongated heat transmitting member surrounding said heater bar and being slidable with respect thereto; each said sealing shoe part straddling said heat transmitting member with said legs.

4,160,690

GAS ETCHING METHOD AND APPARATUS

Masahiro Shibagaki, Hiratsuka; Yasuhiro Horiike, Tokyo, and Takashi Yamazaki, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 31, 1978, Ser. No. 892,330
Claims priority, application Japan, Mar. 31, 1977, 52-35448
Int. Cl.[2] C23F *1/02*; C23C *15/00*; B01K *1/00*
U.S. Cl. 156—643 **12 Claims**



1. A gas etching apparatus comprising an etching gas-producing chamber; means for introducing into said chamber a mixture of a gas containing fluorine atoms and a gas containing oxygen atoms; means for activating the gas mixture received in the etching gas-producing chamber; an etching chamber provided in a region located apart from the etching gas-producing chamber and free from an electric field produced by the activating means; means for exhausting the etching gas from the etching chamber; and an etching gas-conducting means pro-

viding communication between the etching gas-producing chamber and the etching chamber and having conductance conforming to the formula:

$$10^{-1}Se \leqq C_T \leqq 5 \times 10^2 Se$$

where:

C_T = conductance (l/min) of the etching gas-conducting means;

Se = effective exhaust speed (l/min) in the etching chamber.

2. The gas etching apparatus according to claim 1, wherein the means for activating the gas mixture is high frequency discharging means.

3. The gas etching apparatus according to claim 2, wherein the high frequency discharging means is microwave discharging means.

10. A gas etching process which comprises the steps of introducing a mixture of a gas containing fluorine atoms and a gas containing oxygen atoms into an etching gas-producing chamber; activating the gas mixture; introducing the activated gas mixture through an etching gas-conducting means into an etching chamber provided in a region located apart from the etching gas-producing chamber and free from an electric field produced by activating the gas mixture; exhausting the gas mixture from the etching chamber; and etching a nongaseous material received in the etching chamber by the activated gas mixture, wherein the activated gas mixture is conducted into the etching chamber to satisfy the formula:

$$10^{-1}Se \leqq C_T \leqq 5 \times 10^2 Se$$

where:

C_T = conductance (l/min) of the etching gas-conducting means;

Se = effective exhaust speed (l/min) in the etching chamber.

4,160,691

ETCH PROCESS FOR CHROMIUM

Oscar R. Abolafia, Endwell, and John Rasile, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,073

Int. Cl.² C23F *1/00*

U.S. Cl. 156—664 **10 Claims**

1. A process for etching chromium comprising contacting the chromium with a mixture comprising from about 5 to 20% by volume of concentrated HCl, from about 65 to 95% by volume of a water miscible organic solvent and from about 0 to 30% by volume water at a temperature of from about 50° to 95° C.

4,160,692

WIPED FILM EVAPORATORS

James Mitchell, and Thomas N. Pye, both of Leven, Scotland, assignors to Henry Balfour & Company Limited, Fife, Scotland

Filed Jul. 18, 1977, Ser. No. 817,003

Claims priority, application United Kingdom, Dec. 10, 1976, 51576/76

Int. Cl.² B01D *1/22*

U.S. Cl. 159—6 W **16 Claims**

1. A wiped-film evaporator for corrosive liquids, said wiped-film evaporator comprising,

(i) a vertically oriented cylindrical vessel, having a substantially smooth contoured inner surface, and having a corrosion resistant glass lining on said inner surface;

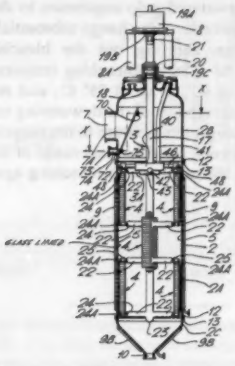
(ii) rotary shaft means within the vessel supported in bearing means and connectible to a drive, said rotary shaft means having a corrosion resistant lining on the external surface thereof;

(iii) an inlet for delivery of liquid to be evaporated into the cylindrical vessel;

(iv) an outlet for vapour;

(v) corrosion resistant wiping means for wiping the internal surface of the cylindrical vessel for the formation of a liquid film on the internal surface, said wiping means including a plurality of wiping units each wiping unit including a series of vertically stacked side-by-side wiping elements each of relatively small vertical extent and each pivotally mounted on a vertical spindle so as to adopt in use a trailing configuration relative to a radius of the vessel passing through the centre line of the spindle; and

(vi) A plurality of wiper support means carried by the rotary shaft means, each wiper support means comprising a pair



of axially-spaced radially-extending support members, mounting means being provided on the support members for support of one of said wiping units between the support members, said mounting means including socket devices receiving said vertical spindle of the wiping unit;

(vii) each wiping element engaging the internal surface of the vessel to wipe a narrow annular strip on said internal surface and each element being individually pivotal whereby each wiping unit can cater for irregularities in the roundness and straightness of the portion of said internal surface wiped by the wiping unit.

4,160,693

PROCESS FOR THE BLEACHING OF CELLULOSE PULP

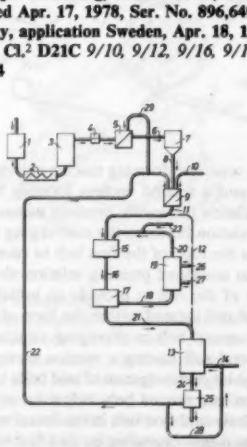
Jonas A. I. Lindahl, Domsjo; Ernst B. Tiberg, Ornskoldsvik, and Sten L. Haggstrom, Overhornas, all of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Apr. 17, 1978, Ser. No. 896,649

Claims priority, application Sweden, Apr. 18, 1977, 7704404

Int. Cl.² D21C *9/10, 9/12, 9/16, 9/18*

U.S. Cl. 162—24 **12 Claims**



1. A process for the bleaching of lignocellulosic material, which comprises forming a pulp suspension of lignocellulosic

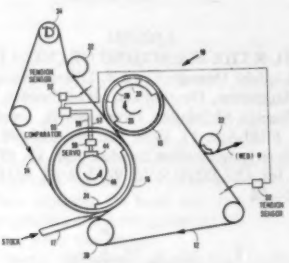
material having a consistency within the range from about 18% to about 55%; mixing the suspension in a mixing zone with a bleaching agent while adjusting the consistency of the pulp suspension to within the range from about 2% to about 15% and the temperature of the pulp suspension to within the range from about +10° C. to about −10° C. of a temperature within the range from about 40° to about 95° C. at which bleaching is to be carried out; quickly dewatering the pulp suspension to a pulp consistency within the range from about 18 to about 50%, equal to or at most 5% less than the initial pulp consistency of the pulp suspension charged to the mixing zone; passing the dewatered pulp suspension to the bleaching zone before its temperature can change substantially from the adjusted temperature; carrying out the bleaching with a bleaching agent at the selected bleaching temperature within the range from about 40° to about 95° C.; and recycling the bleaching liquor recovered from the dewatering to the mixing zone while maintaining a temperature in the recycled liquor to bring the pulp suspension to within said range of the bleaching temperature during the mixing with bleaching agent.

4,160,694

TWIN WIRE WEB FORMING WITH WIRE TENSION CONTROL

Ralph J. Futcher, Beaconsfield, Canada, assignor to Dominion Engineering Works Limited, Lachine, Canada

Filed Dec. 23, 1977, Ser. No. 863,945
Int. Cl.² D21F *1/40, 7/02*
U.S. Cl. 162—256 **4 Claims**



1. In a twin-wire web forming machine having a first endless forming belt and a second endless forming belt arranged in converging relation therewith; headbox means to feed stock in sandwiched relation between the converging belts; a first roll located within the loop of the first belt to receive the first and second belts in tensioned pressing relation about a portion of the periphery of the roll to provide an initial web formation zone, a second roll located within the loop of the second belt, to guide the second belt in diverging relation from the first belt, said second roll having a suction compartment therein adjacent the point of divergence of said belts to assist retention of said web on said second belt, belt drive means within said first loop to draw said first belt in tensioned relation from said first roll, brake means operating on said first roll in load applying relation, and brake control means to provide a predetermined value of tension to said first belt.

4,160,695

PROCESS FOR THE PRODUCTION OF GLUCOSE FROM CELLULOSE-CONTAINING VEGETABLE RAW MATERIALS

Hans-Hermann Dietrichs, Reinbek; Michael Sinner, Dassendorf; Fritz Opderbek, Münich, and Karl-Heinz Brachthäuser, Ratingen, all of Fed. Rep. of Germany, assignors to Projektierung Chemische Verfahrenstechnik Gesellschaft mit beschrankter Haftung, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,463
Claims priority, application Austria, Jul. 20, 1976, 5345/76
Int. Cl.² C12D *13/02;* C13K *1/02*
U.S. Cl. 435—101 **6 Claims**

1. A process for the production of glucose from cellulose-containing vegetable raw material which can be disintegrated by steam pressure treatment and defibrination consisting essentially of the steps of

(a) treating cellulose-containing vegetable raw material with saturated steam at temperatures of from about 160° to 230° C. for a period of from about 2 minutes to about 4 hours to disintegrate the raw material,

(b) lixiviating the disintegrated raw material with an aqueous solution of alkali to leave a fibrinous residue, and

(c) subjecting the fibrinous residue to acid or enzymatic hydrolysis under conditions to produce glucose.

4,160,696

ASCORBIC ACID DETERMINATION

Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,921
Int. Cl.² G01N *31/14*
U.S. Cl. 435—25 **19 Claims**

1. A composition for the detection of ascorbic acid comprising a dry mixture of sufficient ascorbic acid oxidase, coupling substance and buffer as to provide upon addition of water an aqueous composition buffered to a pH of between about 5.7 and about 8.7 and comprising at least about 10 μg/ml of ascorbic acid oxidase, and from about 5×10^{-3} to about 10^{-2} M coupling substance which interacts with dehydroascorbic acid to produce a detectable product.

4,160,697

METHOD FOR PURIFICATION OF CRUDE UROKINASE

Ichiro Chibata, Suita; Toshio Kakimoto, Minamikawachi; Yoshiaki Kakie, Takatsuki; Takeji Shibatani, Kobe, and Noriyuki Nishimura, Nara, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Mar. 23, 1978, Ser. No. 889,385
Claims priority, application Japan, Apr. 9, 1977, 52-40683; Apr. 28, 1977, 52-49634; Sep. 30, 1977, 52-118321
Int. Cl.² C07G *7/026*
U.S. Cl. 435—194 **32 Claims**

1. A method of purifying crude urokinase which comprises contacting an aqueous urokinase solution with a water-insoluble, hydrophilic polysaccharide having a group of the formula:

$$-CH_2CH(OH)CH_2R$$

wherein R is sulfothio, sulfo or p-sulfophenylamino, to have urokinase adsorbed thereon, and eluting the adsorbed urokinase from said polysaccharide to recover urokinase.

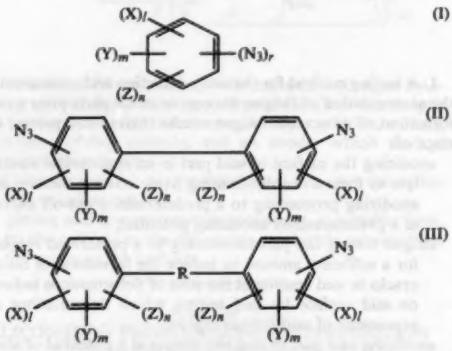
4,160,698
ENZYME IMMOBILIZATION WITH AZIDO COMPOUNDS

Sachio Miyairi, Chigasaki; Hideaki Tanaka, Hiratsuka; Akira Yabe, Fujisawa, and Koichi Honda, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Sep. 8, 1977, Ser. No. 831,649
Claims priority, application Japan, Sep. 9, 1976, 51/108154
Int. Cl.[2] C07G 7/02
U.S. Cl. 435—173 **11 Claims**

1. A method for the immobilization of an enzyme comprising the steps of:

mixing about 1 to about 20% by weight enzyme with an aromatic group-containing azido compound and a water-soluble high molecular weight compound, wherein said aromatic group containing azido compound is represented by formulae selected from the group consisting of I, II and III



wherein X, Y and Z each represent one member selected from the group consisting of halogen atoms, alkyl, alkoxyl and hydroxyl groups and salts thereof, sulfonic acid group and salts thereof; l, m and n each represent an integer having the value of from 0 to 4 and, r represents an integer having the value of from 2 to 5; wherein R represents $+CH_2)_p$, $+CH{=}CH)_q$, wherein p and q represent an integer having the value of from 1 to 3, an oxygen atom, a sulfur atom, SO_2 group or NH group;

forming the resultant mixture into a desired shape;

drying said shaped mixture; and

exposing the dried mixture to light to cause the water soluble high molecular weight compound to be bound to one azido group of said azido compound and the enzyme to be bound to another azido group of said azido compound, whereby the enzyme becomes bound to said water soluble high molecular weight compound.

4,160,699
DRIVE SYSTEM FOR AUTOMATIC CULTURE APPARATUS

Shinroku Sogi; Makoto Yoshinaga, both of Hachioji; Toshio Shinohara, Chofu; Takayuki Aihara, and Ikuo Tawara, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,553
Claims priority, application Japan, Nov. 9, 1976, 51-133695
Int. Cl.[2] C12K 1/10
U.S. Cl. 435—287 **5 Claims**

1. A drive system for an automatic culture apparatus of the type which includes an air tight housing having a culture vessel platform, a culture progress observation platform and a separation/distribution work platform disposed therein, said platforms being vertically displaced from each other, said drive system comprising:

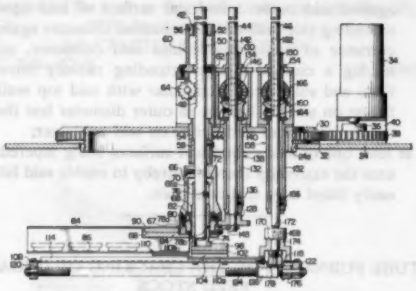
A) a through-opening centrally formed in each of said platforms;

B) a culture vessel carrier movable between said platforms through said openings;

C) a transfer arm for transferring a culture vessel between said vessel carrier and said vessel platform, said vessel carrier and said observation platform, and said vessel carrier and said work platform; and

D) drive mechanism means for:

(1) moving said vessel carrier and said transfer arm in the



vertical direction such that said vessel carrier and said transfer arm may be moved between first, second and third positions adjacent said vessel platform, said observation platform and said work platform, respectively; and

(2) moving said transfer arm in both the horizontal and vertical direction after said vessel carrier and transfer arm are placed in one of said first, second or third positions in such a manner that said transfer arm moves a culture vessel between said vessel carrier and the platform said transfer arm is adjacent.

4,160,700
PETRI DISH

Mary Boomus, Chelsea; Bernard Sobin, and John Schweitzer, both of Ann Arbor, all of Mich., assignors to Gelman Instrument Company, Ann Arbor, Mich.

Filed Feb. 14, 1977, Ser. No. 768,311
Int. Cl.[2] C12B 1/00
U.S. Cl. 435—298 **2 Claims**

1. A petri dish comprising:

a molded, unitary organic resin container having a substantially flat, round bottom wall and a substantially cylindrical side wall extending perpendicularly upwardly from said bottom wall, said side wall having a height of from about $\frac{1}{4}$ to $\frac{1}{2}$ inch and having an outer cylindrical surface with a diameter of from about one to four inches, said container having a circular flange extending radially outwardly from and substantially coplanar with said bottom wall, said flange having and outer diameter about $\frac{1}{4}$ to $\frac{3}{4}$

inch greater than the diameter of the outer surface of said side wall;

and a molded, unitary, transparent organic resin lid for said container having a round top wall and a substantially cylindrical side wall extending perpendicularly downwardly from said top wall, said downwardly extending side wall of said lid having an inner cylindrical surface with a diameter about the same as the diameter of the outer surface of said upwardly extending side wall of said container such that said inner cylindrical surface of said downwardly extending side wall of said lid fits snugly against said outer cylindrical surface of said upwardly extending side wall of said container to assure against the entrance of contaminants into said container, said lid having a circular flange extending radially outwardly from and substantially coplanar with said top wall, said flange on said lid having an outer diameter less than the outer diameter of said flange on said container;

at least one of said cylindrical surfaces being tapered adjacent the extremity thereof thereby to enable said lid to be easily fitted onto said container.

4,160,701
TUBE FURNACE FOR THE CRACKING OF ORGANIC FEED STOCK

Armin Dorner, and Walter Kreuter, both of Münich, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

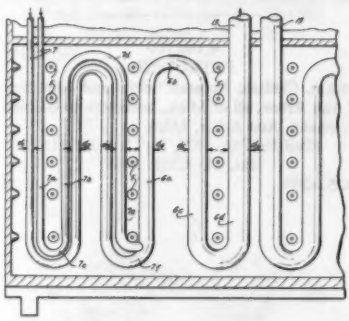
Continuation-in-part of Ser. No. 463,103, Apr. 22, 1974, Pat. No. 4,014,749. This application Dec. 28, 1976, Ser. No. 754,955

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1973, 2320872

The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.[2] C10G *9/20*; F22B *21/24, 37/12*

U.S. Cl. 196—116 **7 Claims**



1. In a tube furnace for thermal cracking of a hydrocarbon, comprising a combustion chamber, and a plurality of duct systems traversing said chamber for conducting a hydrocarbon therethrough, said duct systems each having an inlet side and an outlet side, the improvement wherein said duct system comprises at said inlet sides at least two undulating tubes of said chamber, each tube having a plurality of loops in mutually parallel vertical planes for conducting said hydrocarbon in parallel and, at said outlet side, a common pipe in said chamber of undulating configuration with a plurality of loops in a vertical plane parallel to the vertical planes of said tubes and communicating with said tubes, said tubes opening into and being connected to said pipe and forming a junction therewith, the undulations of said pipes and tubes having upper and lower bends separated by a substantially vertical distance, said pipe having a flow cross section at least equal to that of said tubes at their junction with said pipe, the pitch of the undulations of said tubes being less than the pitch of the undulations of said pipe.

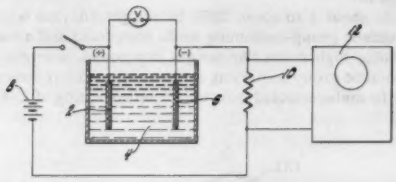
4,160,702
ELECTROCHEMICAL MEASUREMENT OF FATIGUE DAMAGE

William J. Baxter, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1978, Ser. No. 898,614

Int. Cl.[2] G01N *27/42, 3/08*

U.S. Cl. 204—1 T **2 Claims**



1. A testing method for the early detection and assessment of the accumulation of fatigue damage in metal parts prior to the formation of detectable fatigue cracks therein comprising the steps of:

anodizing the surface of said part in an appropriate electrolyte to form a current-limiting oxide coating thereon said anodizing proceeding to a predetermined cut-off current at a predetermined anodizing potential;

fatigue testing the parts according to a prescribed regimen for a sufficient amount to induce the formation of microcracks in said coating at the situs of deformations induced on said surface by said testing which deformations are precursors of said fatigue cracks;

anodizing said part in said electrolyte at a potential of about said predetermined anodizing potential or less until the reanodization current falls off to about said predetermined cut-off current to anodically heal said microcracks; and

determining the transient charge required to heal said microcracks as an indicator of the extent of fatigue accumulated in the part by said fatigue testing.

4,160,703
NONPLATING CATHODE AND METHOD FOR PRODUCING SAME

Richard A. Bird, and Lowell W. Austin, both of Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 830,834, Sep. 6, 1977. This application Jul. 3, 1978, Ser. No. 921,674

Int. Cl.[2] C25D *5/02, 7/06*; C25F *5/00*

U.S. Cl. 204—15 **7 Claims**

1. A method for producing metal strip material having a zinc coating only on one side comprising,

(a) conditioning a lead cathode means so as to immunize it against plating zinc on its surface during an electrolytic operation, said conditioning including immersing the lead cathode means in a zinc ion-containing electrolytic bath, electrolytically causing a light zinc coating to form on the surface of the cathode means, and electrolytically or chemically removing said zinc coating from the cathode means,

(b) immersing a zinc coated metal strip in said electrolytic bath and passing it through the electrolyte solution between anode means and the conditioned lead cathode means, and

(c) electrolytically treating the strip so as to remove the zinc coating from the side of the strip facing the conditioned cathode means while simultaneously depositing a substantially equivalent amount of zinc on the opposite side of the strip.

4,160,704

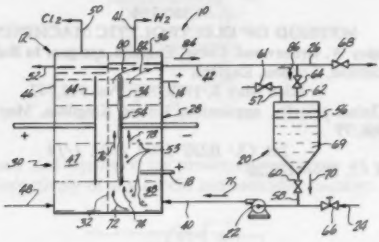
IN SITU REDUCTION OF ELECTRODE OVERVOLTAGE

Han C. Kuo; Byung K. Ahn; Ronald L. Dotson, and Kenneth E. Woodard, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 792,389, Apr. 29, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,360

Int. Cl.[2] C25B *11/04, 11/08;* C25D *5/02, 5/34*

U.S. Cl. 204—32 R 29 Claims



1. A method for reduction of the cathodic hydrogen overvoltage potential of a membrane type chlor-alkali electrolytic cell, having a cathodic chamber, a catholyte solution, a clean, hydrogen-evolving cathode, and an anode, which method comprises the steps of:

(a) introducing low overvoltage metal ions into the catholyte solution; and

b. plating said low overvoltage metal ions, in metallic form, on the cathode in situ by passing an electric current from the anode to the cathode.

4,160,705

SILICON-IRON PRODUCTION AND COMPOSITION AND PROCESS THEREFOR

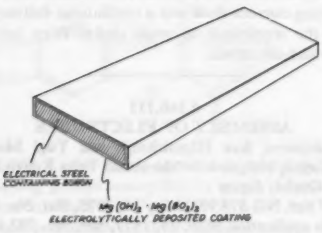
Ronald H. Arendt, and Matthew J. Curran, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,487

The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.

Int. Cl.[2] C25D *5/50;* H01F *1/04*

U.S. Cl. 204—37 R 8 Claims



1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of providing a fine-grained, primary-recrystallized silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about three and 50 parts per million boron, and between about 15 and 95 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, electrolyzing an aqueous solution consisting essentially of magnesium formate and magnesium metaborate and containing magnesia with the silicon-iron sheet being arranged as the cathode in said solution and the said solution being at a temperature of at least about 65° C. and thereby covering the sheet with a boron-containing adherent electrically-insulating coating of $Mg(OH)_2$, and subjecting the coated sheet to a final heat treatment to develop (110) [001] secondary recrystallization texture in the silicon-iron sheet.

4,160,706

COATED SILICON-IRON PRODUCT AND PROCESS THEREFOR USING MAGNESIUM FORMATE AND METABORATE

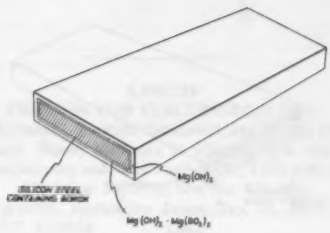
Ronald H. Arendt, and Matthew J. Curran, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,488

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.[2] C25D *5/50;* H01F *1/04*

U.S. Cl. 204—37 R 8 Claims



1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of (a) providing a fine-grained primary-recrystallized silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about three and 50 parts per million boron, and between about 15 and 95 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, (b) electrolyzing a solid MgO-buffered aqueous electrolytic formate-metaborate solution consisting essentially of magnesium formate and magnesium metaborate and containing magnesia with said silicon-iron sheet being arranged as the cathode in said solution and said solution being at a temperature of at least about 65° C. and thereby covering the sheet with a boron-containing adherent electrically insulating but relatively thin coating of $Mg(OH)_2$ to form a primary coated sheet, (c) electrolyzing a solid MgO-buffered electrolytic formate solution consisting essentially of magnesium formate with said primary coated sheet arranged as the cathode in said magnesium formate solution and thereby covering the boron-containing $Mg(OH)_2$ coating with a substantially thicker electrically insulating secondary coating of $Mg(OH)_2$ to form a double-coated sheet, and (d) thereafter subjecting said double-coated sheet to a final heat treatment to develop (110) secondary recrystallization texture in the silicon-iron sheet.

4,160,707

PROCESS FOR APPLYING COATINGS CONTAINING BOTH A METAL AND A SYNTHETIC RESIN

Kees Helle, Bennekom, and Andries Kamp, Zevenaar, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Mar. 22, 1977, Ser. No. 780,051

Claims priority, application Netherlands, Apr. 26, 1976, 7604399

Int. Cl.[2] C25D *3/02, 5/10, 5/50*

U.S. Cl. 204—37 R 17 Claims

1. A process for coating a substrate which comprises codepositing on a substrate serving as a cathode a metal and resin particles having an average particle size of less than about 10 μm from an electroplating bath containing the said resin particles in a concentration of about 3 to 250 g per liter of bath liquid in the presence of both a cationic and a nonionic surface active compound for wetting said resin particles in a molar ratio between 100:1 and 2:1 and in an amount which is at least 4×10^{-3} mmoles per m^2 of the surface area of the particles, said

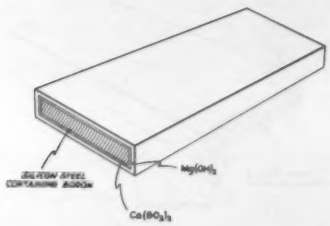
surface active compounds containing no completely fluoridized carbon atoms, and thereafter drying the coating, said resin particles being other than a polyfluorocarbon compound.

4,160,708

COATED SILICON-IRON PRODUCT AND PROCESS THEREFOR USING CALCIUM FORMATE

Ronald H. Arendt, and Matthew J. Curran, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,490
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.
Int. Cl.[2] C25D 5/50; H01F 1/04
U.S. Cl. 204—37 R 9 Claims



1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of (a) providing a fine grained primary-recrystallized silicon-iron sheet containing 2.2 to 4.5 percent silicon, between about three and 50 parts per million boron, and between about 15 and 95 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, (b) electrolyzing an aqueous electrolytic solution consisting essentially of calcium formate and boric acid buffered with solid $Ca(BO_2)_2$ with said silicon-iron sheet being arranged as the cathode in said solution, thereby covering the sheet with an adherent electrically insulating coating of $Ca(BO_2)_2$ to form a $Ca(BO_2)_2$-coated sheet, said solution being maintained at a temperature of at least about 65° C. throughout its period of electrolytic deposition, (c) electrolyzing an aqueous electrolytic solution consisting essentially of solid magnesia-buffered magnesium formate with said $Ca(BO_2)_2$-coated sheet arranged as the cathode in said magnesium formate solution, thereby covering the $Ca(BO_2)_2$ coating with a substantially thicker electrically insulating coating of $Mg(OH)_2$ to form a double-coated sheet, said magnesium formate solution being maintained at a temperature of at least 65° C. throughout its period of electrolytic deposition and (d) thereafter subjecting said double-coated sheet to a final heat treatment to develop (110)[001] secondary recrystallization texture in the silicon-iron sheet.

4,160,709

PROCESS FOR THE GALVANIC DEPOSITION OF NICKEL FROM A NICKEL BATH

Otto Tuscher, Munich; Karl Butter, Ottobrunn, and Kuno Knauer, Jakobneuharting, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 750,688, Dec. 15, 1976, abandoned.
This application May 10, 1978, Ser. No. 904,492
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558423
Int. Cl.[2] C25D 3/12
U.S. Cl. 204—49 3 Claims

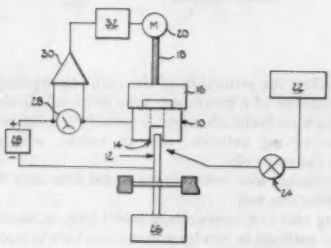
1. In a method for the galvanic deposition of nickel from an electrolyte containing nickel sulfamate and nickel chloride using nickel anodes in bags, the improvement which comprises reducing the formation of oxidation products from the nickel sulfamate and reducing the amount of sulfur in the deposited nickel to less than 15 ppm by precleaning the electrolyte and using a nickel chloride concentration of from 15 to 20 g/l and a cathode current density of at least 3 amp/dm^2, and preventing the escape of anode sludge into the electrolyte by enveloping the anodes in closed mesh bags prior to covering with the anode bags and suctioning the electrolyte from the anode bags and cycling the electrolyte through a selecting bath to the working bath whereby a weldable nickel is produced.

4,160,710

METHOD OF ELECTROLYTIC MACHINING

Stanley W. Greenwood, Colne, England, assignor to Rolls-Royce Limited, London, England

Filed May 3, 1978, Ser. No. 902,747
Claims priority, application United Kingdom, May 6, 1977, 19008/77
Int. Cl.[2] B23P 1/00, 1/04, 1/14
U.S. Cl. 204—129.25 6 Claims



1. A method of electrolytically machining a workpiece with an electrode, including the steps of applying a first pulsed voltage across the workpiece and electrode so as to effect a corresponding pulsed, machining current flow, providing a second, parallel pulsed voltage of identical frequency and which alternates with said first pulsed voltage and providing a further, parallel pulsed voltage, each pulse of which is of sufficient duration to embrace the time taken to put out several of said first and second voltage pulses and, if the outputs of said first, second and further pulses coincide, developing from said coincident outputs a further pulse with which to bring about de-activation of the electrode traverse motor means, to stop forward movement of the electrode, but meanwhile maintaining machining current flow and a continuous delivery of electrolyte to the workpiece to wash sludge from between the workpiece and electrode.

4,160,711

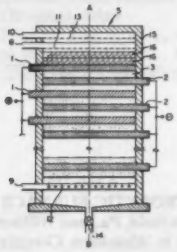
ASSEMBLY OF ELECTRODES

Kazuo Nishizawa; Ken Higashitsuji, and Yugi Mori, all of Kyoto, Japan, assignors to Marubishi Yuka Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 578,981, May 19, 1975, Pat. No. 4,061,557.
This application Mar. 29, 1977, Ser. No. 782,441
Claims priority, application Japan, May 24, 1974, 49-057927; Oct. 19, 1974, 49-119888
Int. Cl.[2] C02B 1/82; C02C 5/12
U.S. Cl. 204—152 2 Claims

1. A continuous process for the removal of solutes from an aqueous solution containing the same dissolved therein, said solutes being capable of forming insoluble materials depending upon the pH of the solution, which process comprises the steps of causing said aqueous solution to flow gravitationally downwards in the form of thin films over a vertical fabric of non-conductive material in which a plurality of elongated conductive elements are incorporated so as to be substantially horizontal parallel and spaced apart from each other and applying a potential to said conductive elements so as to produce a

suitably steady pH distribution in the thin films of the solution flowing downwards over the fabric, whereby said solutes are



insolubilized and deposited on predetermined zones of said fabric irrespectively of any anodic and cathodic reactions.

4,160,712
PROCESS FOR PREPARING NOVEL N-CARBOXYL-α-AMINO ACID ANHYDRIDES

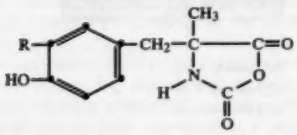
Walfred S. Saari, and Joel R. Huff, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 773,258, Mar. 1, 1977, Pat. No. 4,120,971. This application Apr. 13, 1978, Ser. No. 895,846

Int. Cl.[2] B01J *1/10*; C07D *263/02*

U.S. Cl. 204—158 R 8 Claims

1. A process for preparing compounds having the formula:

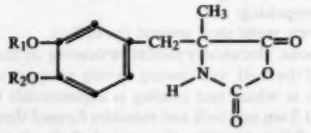


I

wherein R is hydrogen or hydroxy which comprises

(A) catalytic hydrogenation in a non-aqueous system of

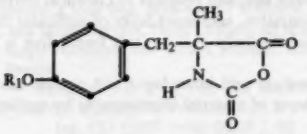
(a) a compound having the formula



Ia

wherein R_1 and R_2 are separate or joined and comprise blocking groups susceptible to removal by said hydrogenation, when R in formula I is —OH or

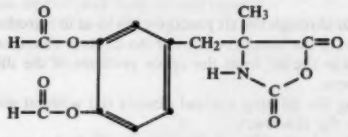
(b) a compound having the formula



Ib

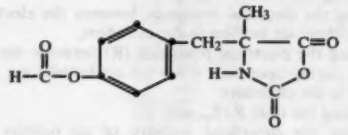
wherein R_1 is a blocking group susceptible to removal by said hydrogenation, when R in formula I is hydrogen. or

(B) photolysis in a non-aqueous system of a compound having the formula



Id

or



Ie

4,160,713
PROCESS FOR ELECTRO-DIALYSIS

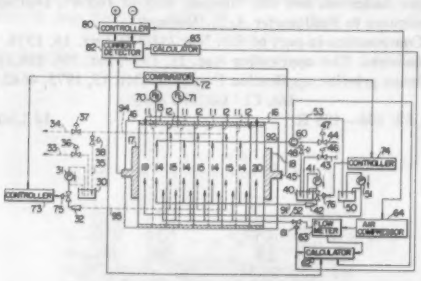
Harumi Matsuzaki; Sankichi Takahashi, and Osamu Kuroda, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Plant Engineering and Construction Co., Ltd., both of, Japan

Filed Jan. 30, 1978, Ser. No. 873,680

Claims priority, application Japan, Jan. 31, 1977, 52-8665; Jan. 31, 1977, 52-8666

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—180 P 19 Claims



1. In a process for electro-dialyzing an electrolyte solution in an electro-dialysis apparatus, comprising the steps of:

providing a plurality of alternately counterposed cation exchange membranes and anion exchange membranes;

providing a plurality of frames interposed between the ion exchange membranes, thereby forming dilution chambers and concentration chambers alternately between the counterposed ion exchange membranes;

providing supply and discharge passageways for the electrolyte solution, through the frames, through which the electrolyte solution is introduced to and discharged from the respective dilution chambers and concentration chambers,

providing supply and discharge passageways for air bubbles, formed through the frames, through which air bubbles are introduced to lower parts and discharged from upper parts of the dilution chambers;

applying an electric potential to a pair of electrodes respectively at both ends of the plurality of the dilution chambers and the concentration chambers, thereby diluting the electrolyte solution in the dilution chambers and concentrating the electrolyte solution in the concentration chambers by migration of ions due to electrophoresis of ions in the electrolyte solution and selective ion permeability of the ion exchange membranes;

passing electrolyte solution diluted in the dilution chambers and electrolyte solution concentrated in the concentration

chambers through their respective chambers and passageways;

passing air through the air passageways so as to introduce air bubbles to the lower portions of the dilution chambers and discharge the air from the upper portions of the dilution chambers;

measuring the limiting current density (i_o) without air bubbles in the chambers;

monitoring the limiting current density (i) during operation when the air bubbles are introduced in the chambers;

determining the ratio of i/i_o;

measuring the electrical resistance between the electrodes (R_o) without air bubbles in the chambers;

monitoring the electrical resistance (R) between the electrodes during operation when the air bubbles are introduced in the chambers;

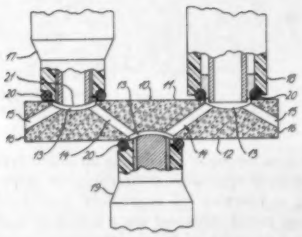
determining the ratio R/R_o; and

controlling the superficial velocity of air bubbles (Va) through the dilution chambers during operation so that Va is maintained within the range of superficial air velocity that maintains R/R_o less than one and i/i_o constant and Va optimum with respect to both conductivity of electrolyte and resistance between electrodes, whereby the thickness of the diffusion layers formed by concentration polarization near the ion exchange membranes in the dilution chambers are maintained smaller than when no air bubbles are introduced thereto.

4,160,714
MEASURING CHAMBER UNIT

Jørgen Andersen, and Ole Nielsen, both of Herlev, Denmark, assignors to Radiometer A/S, Denmark

Continuation-in-part of Ser. No. 732,340, Oct. 14, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,933
Claims priority, application Denmark, Oct. 15, 1975, 4645/75
Int. Cl.[2] G01N *27/28*
U.S. Cl. 204—195 R **14 Claims**



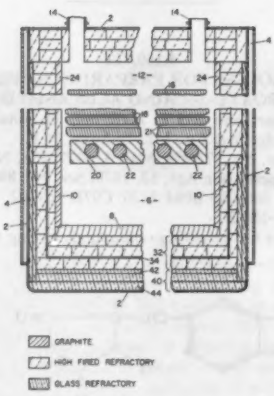
1. A block-shaped measuring chamber unit, especially for use in electrochemical measuring apparatus, comprising differently orientated surface parts and a plurality of separate, shallow chamber-forming depressions formed in said surface parts, at least one of said depressions being formed in each of said surface parts, respectively, each of said depressions having a fluid inlet and a separate fluid outlet, said fluid inlets and outlets being formed solely as straight passages in said unit, and comprising straight passages each interconnecting two of said depressions and being oblique to the surface parts in which said two depressions are formed.

13. An electrochemical measuring apparatus comprising a block-shaped measuring chamber unit having differently orientated surface parts and a plurality of separate, shallow chamber-forming depressions formed in said surface parts, at least one of said depressions being formed in each of said surface parts, respectively, each of said depressions having a fluid inlet and a separate fluid outlet, said fluid inlets and outlets being formed solely as straight passages in said unit, and comprising straight passages each interconnecting two of said depressions and being oblique to the surface parts in which said two depressions are formed, and measuring instruments sealed to said unit and closing said depressions respectively to form chambers.

4,160,715
ELECTROLYTIC FURNACE LINING

Donald L. Kinosz, Arnold, Pa., and William R. Allen, Maryville, Tenn., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 28, 1978, Ser. No. 919,771
Int. Cl.[2] C25C *3/08, 3/06*
U.S. Cl. 204—243 R **11 Claims**



1. In a cell for producing aluminum by the electrolysis of aluminum chloride in a bath of aluminum chloride dissolved in at least one molten salt of higher electrodecomposition potential than aluminum chloride, said cell including at least two opposed electrodes having interelectrode space therebetween, a cell lining comprising:

(a) a perimetric metal shell around the cell;

(b) a continuous, electrically insulative coating on the inside surfaces of the shell, said coating having an upper temperature limit at which said coating is impenetrable by said molten salt from said bath and eutectics formed therefrom;

(c) a thermal lining within the coated shell of sufficient thickness that heat flow therethrough is uniformly maintained such that the insulative coating is not exposed to temperatures above said upper temperatures limit, comprising:

(1) an inner layer of high-fired refractory, penetrable by said molten salt, and resistant to chemical corrosion by said penetration, said inner layer of sufficient thickness that a substantially uniform salt freeze line is located therein,

(2) intermediate said inner layer and outside said freeze line, a layer of material impenetrable by molten aluminum,

(3) around and adjacent said inner layer, at least one layer of insulative glass refractory; and

(d) a perimetric carbonaceous lining along the lower, interior portions of the cell, adjacent the inner layer of high-fired refractory, for containing the produced molten aluminum therein.

4,160,716

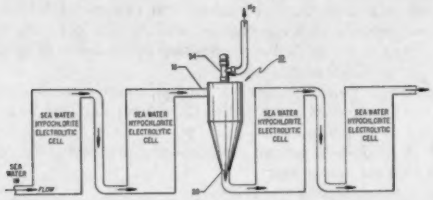
METHOD FOR REMOVING AN ENTRAINED GAS FROM A LIQUID MEDIUM

Russell M. Wiseman, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 718,833, Aug. 3, 1976, Pat. No. 4,097,358. This application Mar. 30, 1978, Ser. No. 891,692

Int. Cl.[2] C25B *1/34, 15/08;* B01D *47/00*

U.S. Cl. 204—270 1 Claim



1. A method for removing gaseous substances from the electrolyte flowing through a series of electrolytic cells comprising the steps of: introducing the electrolyte into a group of electrolytic cells numbering in the range of one to three connected in a series; introducing the output of the series of electrolytic cells into the top cylindrical section of a cyclone horizontally tangent to the interior surface so as to form a vortex aided by the form of the conical bottom section of the cyclone; allowing the gaseous substances to escape through an orifice in the top of the cyclone while severely restricting the flow of the electrolyte therethrough and into an exhaust system; arresting the circular flow of the electrolyte as it nears the bottom of the cyclone by means of a planar baffle attached to the interior wall of the outlet of the cyclone so as to protrude slightly into the conical bottom section; allowing the electrolyte to exit through the bottom of the cyclone with a slight back pressure to enhance separation of the gaseous substances from the electrolyte; and introducing the electrolyte with gaseous substances removed into a group of electrolytic cells numbering in the range of one to three connected in a series for further electrochemical production.

4,160,717

ELECTRIC CONTACT POST FOR ELECTROCHEMICAL MACHINE

Gérard Navaro, Cleon Sud; Jean-Pierre Maillard, Fontenay aux Roses, and Serge Lacroix, Saint Gratien, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 1, 1978, Ser. No. 882,325

Claims priority, application France, Mar. 2, 1977, 77 06046

Int. Cl.[2] C25F *7/00;* B23P *1/02*

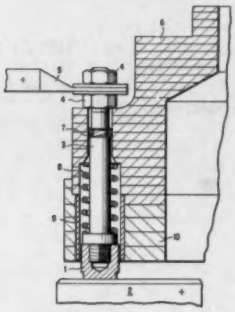
U.S. Cl. 204—279 5 Claims

1. In an electrochemical tool for machining a workpiece, an electric contact post comprising:

a support of nonconducting material having a through hole;

a current conducting guide rod slidable without play in said hole of said support;

a sleeve of heat and corrosion resistant material disposed in one end of said hole of said support;



a tip fixed to one end of said guide rod and slidable with sufficient play to avoid jamming in said sleeve; and

a spring arranged to press said tip against said workpiece.

4,160,718

SOLVENT EXTRACTION PROCESS

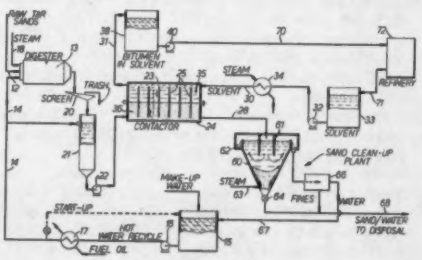
John S. Rendall, Stanford-le-Hope, England, assignor to Rohrtil S. A., Lugano, Switzerland

Filed Aug. 3, 1977, Ser. No. 821,497

Claims priority, application United Kingdom, Aug. 7, 1976, 32989/76; Jan. 25, 1977, 2939/77

Int. Cl.[2] C10G *1/04*

U.S. Cl. 208—11 LE 26 Claims



1. A continuous process for the solvent extraction of bitumen oils from tar-sand, comprising the steps of:

(a) supplying tar-sand at a supply point to a contactor and passing said tar-sand from said supply point towards a discharge point from said contactor;

(b) passing a stream of solvent through said contactor, said solvent being of lesser density than, and substantially immiscible with, water;

(c) supplying water to and withdrawing water from said contactor;

(d) said solvent stream and said water providing a solvent phase and a water phase in said contactor substantially distinct from each other, and said contactor being substantially filled by said solvent phase, said water phase and solids of said tar-sand with a barrier layer formed by said water phase between said solvent phase and solids;

(e) repeatedly showering solids of said tar-sand through said liquid phases in said contactor as the tar-sand passes through the contactor towards said discharge point, whereby said solids are contacted with said solvent phase and bitumen oils are progressively dissolved in said solvent phase;

(f) removing a bitumen oils-containing solvent phase from said contactor; and

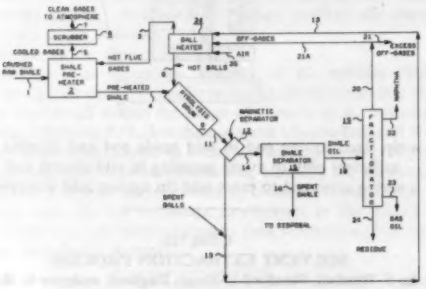
(g) removing a discard stream at said discharge point, said discard stream comprising said withdrawn water and sand which is substantially free of bitumen oils and solvent.

4,160,719

IRON-CONTAINING REFRACTORY BALLS FOR RETORTING OIL SHALE

Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 28, 1977, Ser. No. 837,130
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R **10 Claims**



1. A process of retorting oil shale which comprises

a. preheating crushed raw oil shale employing hot flue gases hereinafter recited,

b. pyrolyzing said preheated crushed oil shale with hot iron-containing ceramic balls under conditions of temperature, pressure, and for a time sufficient to substantially convert said oil shale to produce a pyrolyzed admixture of shale oil, spent hot shale, and spent carbonaceous iron-containing ceramic balls, wherein said iron-containing ceramic balls contain about 10 to 90 weight percent iron in a sufficient state as to permit magnetic separation from said spent shale,

c. magnetically separating from said pyrolyzed admixture said hot spent carbonaceous iron-containing ceramic balls employing magnetic separation means,

d. separating said shale oil from said spent shale,

e. fractionating said shale oil to obtain light-ends as off-gases,

f. contacting said carbonaceous iron-containing spent ceramic balls with at least a portion of said off-gases and air, thereby substantially burning off said carbonaceous residue and producing reheated hot magnetic ceramic balls and a stream of hot flue gases,

g. cycling said hot flue gases to said step (a) thereby preheating said crushed oil shale,

h. recycling said hot reheated iron-containing ceramic balls to said contacting step (b), and

i. wherein said separated spent hot shale is at least in part brought into indirect heat exchange with said incoming crushed raw oil shale prior to said preheating step (a), thus recovering heat from said hot spent oil shale and at least partially cooling the hot spent oil shale prior to disposal thereof.

4,160,720

PROCESS AND APPARATUS TO PRODUCE SYNTHETIC CRUDE OIL FROM TAR SANDS

Junior D. Seader, and Kirshnakumar M. Jayakar, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Dec. 15, 1977, Ser. No. 851,226
Int. Cl.[2] C10G *1/00*; C10B *49/10, 49/00*
U.S. Cl. 208—11 R **19 Claims**

1. An apparatus for processing bitumen-bearing tar sands for the recovery of bitumen therefrom comprising:

means for maintaining a first fluidized bed for the bitumen-bearing tar sands, the first fluidized bed serving as a pyrolysis zone for bitumen of the bitumen-bearing tar sands, the pyrolysis zone cracking a substantial portion of the bitumen and thereby volatilizing the same while leaving a carbon residue in the form of coke on the tar sands;

means for introducing a comminuted, bitumen-bearing tar sand into the first fluidized bed;

means for introducing coked tar sands from the first fluidized bed into a second fluidized bed;

means for maintaining the second fluidized bed for the coked tar sands from the first fluidized bed, the second fluidized bed serving as a combustion zone for the coke on the coked tar sands to thereby develop thermal energy in the second fluidized bed; and

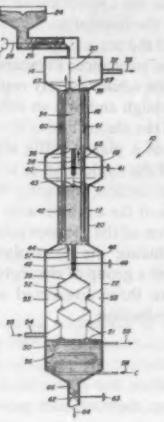
heat transfer means comprising heat pipe means for conducting the thermal energy from the second fluidized bed to the first fluidized bed.

19. A single-pass process for producing synthetic cruce oil from tar sand comprising:

vertically orienting an enclosed vessel;

segregating the vessel into an upper, pyrolysis zone and a lower, combustion zone;

introducing a comminuted tar sand into the pyrolysis zone thereby producing vapors of synthetic crude oil and a coked sand comprising a coke residue on particles of sand from the tar sand;



feeding coked sand downwardly under the force of gravity from the pyrolysis zone to the combustion zone;

generating thermal energy in the combustion zone by burning the coke residue on the coked sand while producing flue gases and burnt sand;

removing burnt sand downwardly from the combustion zone under the force of gravity;

injecting combustion air into the vessel below the combustion zone, the combustion air absorbing thermal energy from the burnt sand and fluidizing at least a portion of the coked sand in the combustion zone while supporting combustion of the coke residue, the combustion air becoming flue gases in combination with gaseous combustion products from the combustion zone;

fluidizing at least a portion of the comminuted tar sand in the pyrolysis zone with the flue gases from the combustion zone, the flue gases commingling with and carrying away the vapors of synthetic crude oil from the pyrolysis zone;

removing the commingled flue gases and vapors of synthetic crude oil from the upper end of the vessel;

withdrawing the burnt sand from the lower end of the vessel; and

transferring a substantial portion of the thermal energy not contained in the flue gases but generated in the combus-

tion zone from the combustion zone to the pyrolysis zone by embedding a first end of a heat pipe means in the combustion zone and a second end of the heat pipe means in the pyrolysis zone, the thermal energy pyrolyzing the tar sand thereby producing vapors of synthetic crude oil.

4,160,721

DE-SULFURIZATION OF PETROLEUM RESIDUES USING MELT OF ALKALI METAL SULFIDE HYDRATES OR HYDROXIDE HYDRATES

Rollan Swanson, 220 California Ave., Santa Monica, Calif. 90403

Filed Apr. 20, 1978, Ser. No. 898,206
Int. Cl.² C10G *34/00, 29/10, 19/00*
U.S. Cl. 208—230 **11 Claims**

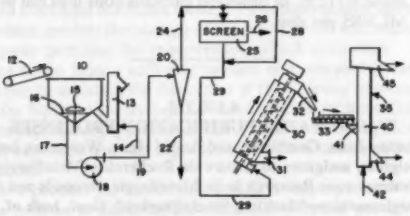
1. A process for reducing the elemental and organic sulfur content of petroleum residues, comprising contacting said residues with at least 0.25 volume thereof of a melt selected from the group consisting of alkali metal sulfide hydrates, alkali metal hydroxide hydrates or mixtures thereof at a process temperature range of between 120 degrees C. to 325 degrees C. for from about 3 to 60 minutes; separating said residues now having a reduced sulfur content from said melt; passing steam through said separated residues to separate said hydrates from said residues, and recovering said residues from separated water containing said hydrates.

4,160,722

RECOVERY OF PLASTIC FROM MUNICIPAL WASTE

Paul G. Marsh, Hamilton, Ohio, assignor to Black Clawson Fibreclaim, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 675,133, Apr. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 490,568, Jul. 22, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,095
Int. Cl.² B03B *1/00*; B07B *4/02*
U.S. Cl. 209—4 **11 Claims**



1. The process of recovering sheet plastic material from a mixture thereof with other solid waste materials including water absorbent fibrous material such as waste paper, comprising:

(a) converting said mixture to a particulate mass of a predetermined maximum particle size wherein the liquid content is at least approximately equal to the fibrous constituents thereof to impart soggy but readily crumbly characteristics to said mass, and

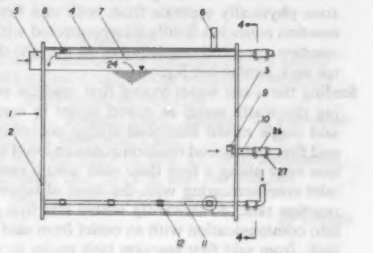
(b) subjecting said soggy but crumbly particulate mass to an air separation treatment causing the pieces of sheet plastic to be blown free of the remainder thereof.

4,160,723

METHOD AND APPARATUS FOR REMOVAL OF POLLUTANTS FROM WASTE WATER

Andrew J. Kovacs, 157 Lardintown Rd., Sarver, Pa. 16055

Filed May 10, 1976, Ser. No. 685,005
Int. Cl.² C02C *1/08, 1/12*
U.S. Cl. 210—7 **13 Claims**



1. Apparatus for removing pollutants from waste water, comprising:

an aeration tank including means of entry into which waste water is fed, said tank being horizontally disposed and having curved side walls;

an oxygen diffusing system within said aeration tank including means for diffusing oxygen at spaced intervals substantially along said tank, said diffused oxygen causing sludge in said tank to circulate in at least one rolling path;

a clarifier tank to be used in combination with said aeration tank for the purpose of separating said sludge from clarified liquid;

transfer means for transferring contents from said aeration tank to said clarifier tank;

means to return said sludge from said clarifier tank to said aeration tank, said return means being designed and positioned to direct said sludge to the proximity of incoming waste water, with said oxygen diffusing system being positioned to provide oxygen to the proximity of said incoming sludge and said incoming waste water and to further provide oxygen, at said spaced intervals throughout said aeration tank, whereby conducive conditions are provided for aerobic decomposition of waste matter; and,

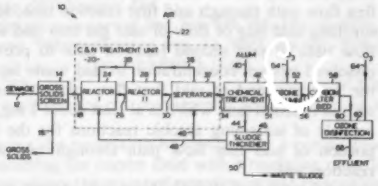
means to expel the clarified liquid from said clarifier tank at more than one level, an upper level providing a faster flow rate than a lower level.

4,160,724

WASTE WATER TREATMENT

Richard V. Laughton, Milton, Canada, assignor to Ontario Research Foundation, Sheridan Park, Canada

Continuation-in-part of Ser. No. 741,221, Nov. 12, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 916,868
Int. Cl.² C02C *1/06*
U.S. Cl. 210—7 **7 Claims**



1. A method for the treatment of waste water containing contaminants including dissolved biodegradable carbonaceous material and nitrogenous material mainly in non-nitrate and/or

non-nitrite form by biological consumption and conversion to gases using a single mixed microbial sludge, which consists essentially of:

establishing a first reaction zone consisting of a first upright reaction tank containing liquor, a second reaction zone physically separate from but fluidly interconnected with said first reaction zone and consisting of a second upright reaction tank containing liquor, and a sludge separation zone physically separate from both said first and second reaction zones but fluidly interconnected with said second reaction zone and consisting of an upright sludge separator tank containing liquor,

feeding the waste water to said first reaction zone and passing the waste water as mixed liquor in association with said single mixed microbial sludge successively through said first and second reaction zones and said sludge separation zone along a first flow path which extends from an inlet communicating with the level of liquor in said first reaction tank, downwardly within said first reaction tank into communication with an outlet from said first reaction tank, from said first reaction tank outlet to an inlet communicating with the level of liquor in said second reaction tank, downwardly within said second reaction tank into communication with an outlet from said second reaction tank, from said second reaction tank outlet to an inlet communicating with the level of liquor in said sludge separation tank, and downwardly within said sludge separation tank into communication with a clarified liquor outlet from said sludge separation tank,

recycling said mixed liquor at a suspended solids concentration in each of said reaction zones of about 3000 to about 7000 mg/l within each reaction zone to maintain said mixed liquor substantially in suspension in each of said first and second reaction zones,

establishing and maintaining mainly anoxic conditions in said first reaction zone for conversion of nitrate and/or nitrite nitrogen to nitrogen gas and consumption of carbonaceous material in said conversion,

establishing and maintaining mainly aerobic conditions in said second reaction zone for conversion of nitrogenous material to nitrate and/or nitrite nitrogen and oxidation of carbonaceous material,

said latter steps of internal recycling and establishing said anoxic and aerobic conditions in said respective reaction zones being effected by:

establishing a second flow path within each of said reaction tanks from the bottom of the respective reaction tank to above the liquid level therein,

passing a molecular oxygen containing gas into said second flow path in each of said reaction zones adjacent the lower end thereof at a rate at least sufficient to convey mixed liquor upwardly along said second flow path and maintain said mixed liquor in suspension in each of said tanks,

controlling said rate of flow of said gas into said second flow path of said first reaction tank to provide a dissolved oxygen concentration in said waste liquor at the upstream end of said first flow path which is less than about 0.5 mg/l and is capable of sustaining aerobic reactions only for an initial and short portion of said first flow path through said first reaction tank, and

controlling said rate of flow of said gas into said second flow path of said second reaction tank to provide a dissolved oxygen concentration in said waste liquor at the upstream end of said first flow path within said second reaction tank which is at least about 2 mg/l and capable of sustaining aerobic reactions for the major portion of said first flow path through said second reaction tank,

recycling mixed liquor directly from said second reaction zone to said first reaction zone at a flow rate which is about 200 to about 500% of the flow rate of waste water to said first reaction zone by:

establishing a third flow path directly from the bottom of said second reaction tank to above the liquor level in said first reaction tank, and

passing a molecular oxygen containing gas into said third flow path adjacent the lower end thereof at a rate sufficient to convey said mixed liquor from said second reaction tank to said first reaction tank at a flow rate which is about 200 to about 500% of the flow rate of waste liquor into said first reaction tank,

controlling the dissolved oxygen concentrations in said first and second reaction zones to provide a dissolved oxygen concentration in the mixed liquor entering said third flow path for recycle from said second reaction tank to said first reaction tank which is approximately the same as the dissolved oxygen concentration in the mixed liquor at the upstream end of said first flow path in said first reaction tank and a dissolved oxygen concentration in the mixed liquor at the downstream end of said first flow path in said first reaction zone which is less than about 0.1 mg/l,

venting gases formed in said first and second reaction zones,

at least partially flocculating, separating and settling suspended sludge from treated waste water in said sludge separator tank during passage thereof along said first flow path within said sludge separation tank,

recycling settled sludge from said sludge separator tank directly to said second reaction zone at a flow rate which is at least about 300% of the flow rate of waste water to said first reaction zone and at a rate at least sufficient to prevent anaerobic decomposition of the sludge in the sludge separation zone by:

establishing a fifth flow path directly from the bottom of said sludge separator tank to above the liquor level in said second reaction tank, and

passing a molecular oxygen containing gas into said fifth flow path adjacent the lower end thereof at a rate sufficient to draw said settled sludge into said fifth flow path and convey the same to said second reaction tank at a flow rate which is at least about 300% of the flow rate of waste liquor into said first reaction tank, and

removing clarified treated liquor from said sludge separation zone at a rate which is the same as the rate of feed of waste water to said first reaction zone, said aerobic and anoxic conversions and sludge growth being controlled to remove from said water about 0.006 to about 0.57 lb. of said non-nitrate and/or non-nitrite nitrogenous material per lb. MLVSS per day, about 0.011 lb. to about 0.054 lb. of total nitrogen per lb. of MLVSS per day and about 0.017 to about 0.112 lb. of dissolved carbonaceous material per lb. MLVSS per day.

4,160,725

WASTE WATER PURIFICATION PROCESSES

Christian Josis, Gembloux, and André Hans, Waremme, both of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels and Siderurgiemaritime-Maritime Staalnijverheid, Gent, both of, Belgium

Filed Mar. 23, 1978, Ser. No. 889,481

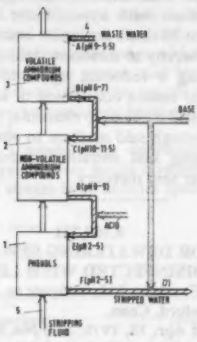
Claims priority, application Luxembourg, Mar. 25, 1977, 77015

Int. Cl.[2] B01D *11/04;* C01C *1/02*

U.S. Cl. 210—21 **6 Claims**

1. A method of operating a stripping column for purifying waste water containing ammonium compounds and phenolic compounds, comprising passing waste water and stripping fluid through the column in counterflow; defining in the column a first region in which non-volatile ammonium compounds are removed from the waste water, defining in the column a second region in which phenolic compounds are removed from the waste water, defining in the column a third

region in which volatile ammonium compounds are removed from the waste water; and disposing the second region at a



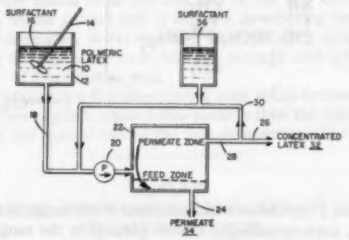
location in the column such that ammoniacal vapor cannot traverse it.

4,160,726

ULTRAFILTRATION PROCESS FOR THE CONCENTRATION OF POLYMERIC LATICES

Joseph DelPico, Brockton, Mass., assignor to Abcor, Inc., Wilmington, Mass.

Filed May 7, 1976, Ser. No. 684,467
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 F **17 Claims**



1. In a process for the concentration or separation of an aqueous polymeric latex, which comprises polymer particles dispersed in an aqueous-liquid phase, by a semipermeable membrane which permits the passage of the liquid phase and retains the polymer particles, the improvement which comprises:

adding to the latex a sufficient amount of a compatible surfactant to maintain the dispersion of the polymer particles in the liquid phase during the concentration or separation process, thereby preventing the formation of coagulum into the latex and the degradation of the flux rate of the process.

17. In a process for the concentration or separation of an aqueous polymeric latex, which comprises polymer particles dispersed in an aqueous liquid phase, by an ultrafiltration semipermeable membrane process wherein the membrane permits the passage of the liquid phase and retains the polymer particles, the improvement which comprises:

(a) providing a latex selected from the group of polymers consisting of vinyl-chloride, butadiene-styrene and natural rubber, which latex, under the process conditions of the ultrafiltration process, becomes destabilized;

(b) adding to the latex a sufficient amount of a compatible anionic or nonionic surfactant to maintain the dispersion of the polymer particles in the liquid phase during the concentration or separation process, thereby preventing the formation of coagulum from the latex and the degradation of the flux rate of the process;

(c) pumping the stabilized latex into the inlet of a feed zone of an ultrafiltration membrane device;

(d) withdrawing a permeate fraction from the permeate zone of the ultrafiltration device;

(e) withdrawing a concentrated latex from the feed zone and recycling by pumping at least a portion of the concentrated latex to the inlet of the feed zone; and

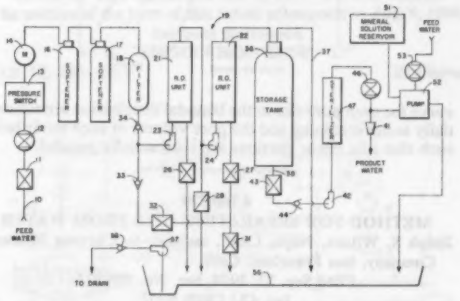
(f) recovering a concentrated latex from the feed zone.

4,160,727

METHOD AND APPARATUS UTILIZING STAGED REVERSE OSMOSIS UNITS FOR PURIFYING AND DISPENSING WATER

Robert M. Harris, Jr., Reseda, Calif., assignor to Foremost-McKesson, Inc., San Francisco, Calif.

Continuation of Ser. No. 551,671, Feb. 21, 1976, abandoned. This application Dec. 7, 1976, Ser. No. 748,285
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—23 H **29 Claims**



12. In a process for purifying and dispensing water using first and second reverse osmosis units with no means for storing water therein, the steps of: delivering water under pressure to the feed water inlet of the first reverse osmosis unit, delivering permeate directly from the first reverse osmosis unit to the feed water inlet of the second reverse osmosis unit as the permeate is produced by the first unit, with no storage of permeate between the units, delivering permeate from the second reverse osmosis unit to a storage tank, dispensing water from the tank, interrupting operation of the reverse osmosis units in the event that the water in the tank rises to a first predetermined level, resuming operation of the reverse osmosis units in the event that the water in the tank drops to a second predetermined level, collecting water spillage from the reverse osmosis units and tank in a sump pan positioned beneath the same, and pumping the water from the sump pan to a drain in the event that the water in the pan reaches a predetermined level.

4,160,728

BIMODAL CHROMATOGRAPHIC RESOLVING ZONE

Joseph J. Kirkland, Wilmington, and Wallace W. Yau, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 748,769, Dec. 8, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,171
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C **40 Claims**

15. In a process for chromatographic separation comprising the steps

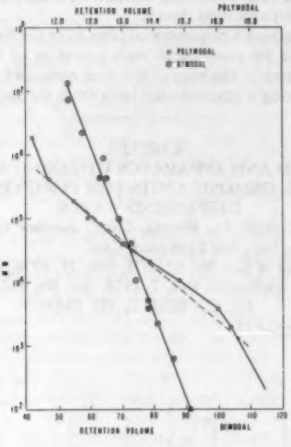
(a) placing the material to be separated in a carrier fluid;

(b) contacting the carrier fluid with a resolving zone; and

(c) determining the extent of retention of said material in the zone,

the improvement comprising using a resolving zone comprising a plurality of macroparticles, said macroparticles being chosen to provide said resolving zone with a bimodal pore size

distribution, the average pore size for each mode being such that the linear portions of the molecular weight calibration



curve for each pore size in the bimodal distribution are substantially nonoverlapping and the pore volume of each mode being such that said linear portions are substantially parallel.

4,160,729

METHOD FOR SEPARATING OILS FROM WATER

Ralph S. Wilcox, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 23, 1974, Ser. No. 508,114
Int. Cl.[2] C02B *9/02*
U.S. Cl. 210—40 **7 Claims**

1. A method for improving oil-contaminated water which comprises:

(1) contacting the water with porous petrolem asphalt bottom, said porous asphalt having been prepared by steps including (a) substantially saturating said asphalt, at a temperature above its softening temperature, with an extractable oil, (b) cooling the resulting mixture to a temperature at least 20° C. below its initial ring-and-ball softening temperature, and (c) removing the extractable oil by solvent extracting said mixture at a temperature below said initial softening temperature; and

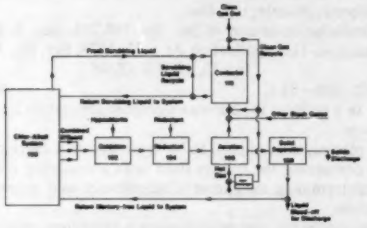
(2) separating the resulting oil-containing bottoms from the water.

4,160,730

PROCESS FOR MERCURY REMOVAL

Xuan T. Nguyen, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Aug. 22, 1977, Ser. No. 826,524
Int. Cl.[2] C22B *43/00*; C02B *1/36*
U.S. Cl. 210—48 **7 Claims**



1. A process for the removal and recovery of mercury from an aqueous medium containing solids having mercury associated therewith, substantially all of said mercury being in the form of inorganic ionic mercury, comprising the steps of: treating said medium with hypochlorite in a molar amount comprising at least 20 times the molar amount of said mercury in said medium thereby to dissociate said ionic mercury from said solids, adding a reducing agent to said hypochlorite treated medium to ensure conversion of substantially all said ionic mercury in said medium to elemental mercury, passing an entraining gas through said medium to entrain said elemental mercury, separating said entrained mercury from said gas thereby to recover said mercury.

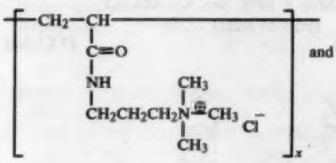
4,160,731

PROCESS FOR DEWATERING SEWAGE SLUDGES DISINFECTED WITH LIME

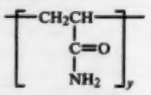
Carlos L. Doyle, Franklin, Ind., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 18, 1978, Ser. No. 897,474
Int. Cl.[2] C02C *3/00*
U.S. Cl. 210—50 **5 Claims**

1. A process for recovering disinfected solids suitable for use as landfill from sewage sludge which process comprises treating said sewage sludge with an amount of lime sufficient to provide a pH of at least 12.0, adding to the thus treated sludge an effective amount of a copolymer containing repeating units of



and



wherein x represents a mole percent in the range of about 3–60 and y, correspondingly, a mole percent in the range of about 97–40, said copolymer having a standard viscosity of at least about 1.5 cps., filtering the resulting sludge to remove water therefrom, and disposing of the disinfected solids thus obtained as landfill.

4,160,732

MECHANICAL DEWATERING PROCESS

Vere Maffet, West Chester, Pa., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 813,577, Jul. 7, 1977, Pat. No. 4,098,006, which is a continuation-in-part of Ser. No. 775,673, Mar. 8, 1977, Pat. No. 4,128,946. This application Mar. 29, 1978, Ser. No. 891,437
Int. Cl.[2] B01D *37/02*
U.S. Cl. 210—75 **13 Claims**

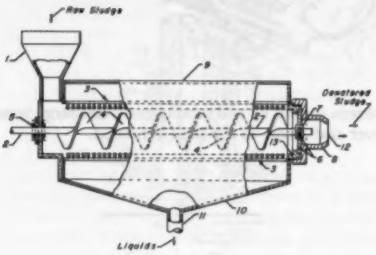
1. A process for dewatering fibrous organic waste which comprises the steps of:

(a) passing a feed stream comprising organic waste and which comprises at least 50 wt.% water and at least 5 wt.% fibers on a dry basis into a first end of a first dewatering zone comprising a cylindrical chamber having a cylindrical porous wall formed by parallel windings which are spaced apart by a distance of about 0.0075 to about 0.013 cm.;

(b) pressurizing the feed stream within the first dewatering zone to a superatmospheric pressure by rotating a screw conveyor having a helical blade which begins at the first

end of the first dewatering zone and which is centrally mounted within the cylindrical chamber while constricting the opening available at a second end of the first dewatering zone to less than the available cross-sectional area of the cylindrical chamber, the blade of the screw conveyor having a helical outer edge which is separated from the inner surface of the porous wall by a distance of from about 0.08 to 5.0 cm. along the length of the porous wall, and with the screw conveyor having a length to diameter ratio above 2:1;

(c) maintaining a substantially continuous and unagitated cylindrical layer of filter media comprising fibers derived from the feed stream in an annular space located between



the inner surface of the porous wall of the cylindrical chamber and the helical outer edge of the screw conveyor, and simultaneously transferring the organic waste located between the grooves of the helical blade of the screw conveyor and surrounded by said cylindrical layer of filter media from the first end of the first dewatering zone to the second end of the first dewatering zone;

(d) withdrawing water radially from the first dewatering zone through the porous wall and through said cylindrical layer of filter media; and,

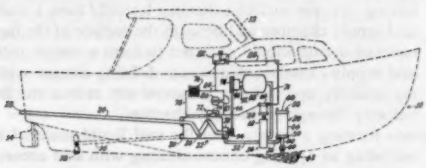
(e) withdrawing a first dewatering zone solids stream having a higher organic waste solids content than the feed stream from the second end of the first dewatering zone.

4,160,733

MARINE ENGINE COOLING WATER FILTER CLEANING SYSTEM

Duane A. Nelson, 1313 Maple St., Neenah, Wis. 54956

Filed Feb. 6, 1978, Ser. No. 875,443
Int. Cl.[2] B01D *35/14, 35/16, 29/38*
U.S. Cl. 210—85 **5 Claims**



1. A water intake system for supplying an engine having a water pump with marine cooling water comprising, in combination,

a water conduit leading from a source of marine water to said pump for normal water flow from said water source to said pump,

a strainer disposed at the end of said conduit at said marine water source,

a filter in said water conduit in fluid flow relation between said strainer and said pump,

a valve means disposed between said filter and said pump, and,

a compressed air source and an air conduit leading from said air source to said valve means at an air inlet,

said valve means including means to close and open said water conduit to said pump and to open and close said air inlet,

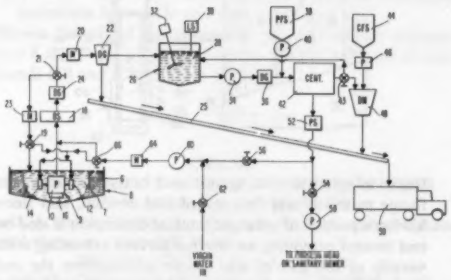
said valve means being operative to close said water conduit to said pump when said engine is overheated due to a clogged condition in said filter and/or said strainer and to open said air inlet to said water conduit and said filter so as to admit compressed air to said water conduit and said filter for a short predetermined time to blow back the clogging material out of said filter and strainer to said water source and further being operative to open said water conduit and close said air inlet after said predetermined time.

4,160,734

CATCH BASIN PROCESSING APPARATUS

Lauren P. Taylor, Swarthmore, and Alex Petroski, Springfield, both of Pa., assignors to LRS Research Limited, Broomall, Pa.

Continuation of Ser. No. 709,566, Jul. 26, 1976, Pat. No. 4,040,960. This application Jul. 5, 1977, Ser. No. 812,483
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.[2] B01D *21/00*
U.S. Cl. 210—96.1 **28 Claims**



1. A catch basin cleaning system for removing liquid, solid and semi-solid wastes from catch basins comprising:

(a) pumping means for injecting liquid under pressure into said catch basin to combine with and suspend wastes therein, including means for removing waste containing liquids therefrom, said pumping means further comprising shunt means for selectively returning waste containing liquids directly to said catch basin;

(b) equalization means for receiving waste containing liquids from at least said pumping means and temporarily holding said waste containing liquids;

(c) dewatering means for receiving said waste containing liquids from said equalization means and for removing liquid from said waste containing liquids to produce at least a liquid and a thickened portion; and

(d) water supply means for supplying liquid at least to said pumping means and for receiving said liquid portion from said dewatering means.

4,160,735

FLUID FILTER BYPASS VALVE ASSEMBLY

Edmund Gregg, Willowick, and Charles E. Pilarczyk, Bedford Heights, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Aug. 5, 1977, Ser. No. 822,168
Int. Cl.[2] B01D *27/10, 35/14*
U.S. Cl. 210—130 **7 Claims**

1. In a fluid filter assembly comprising a filter element, means for supplying fluid under pressure to one side of said filter element, reservoir means for receiving filtered fluid from the other side of said filter element and a normally closed bypass valve means adapted to open and provide communica-

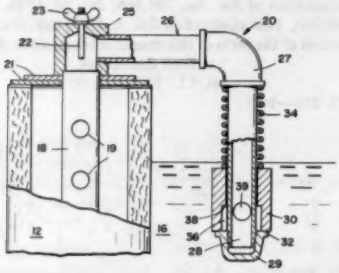
tion between said one side and said other side of said filter element when the fluid pressure at said one side of said filter element exceeds the fluid pressure at the other side of said filter element by a given amount; the improvement wherein said bypass valve means comprises:

(a) an elongated conduit having one end in communication with said one side of said filter element and extending to a free end located below the minimum normal level of fluid in said reservoir means, said conduit having an opening through the sidewall thereof spaced from said free end thereof;

(b) plug means closing said free end of said conduit;

(c) outwardly extending flange means about said free end of said conduit;

(d) a fluid impervious sleeve closely surrounding a portion of said free end of said conduit in slidable engagement with the external surface thereof and with one end of said



sleeve adapted to seat against said outwardly extending flange means at said free end of said conduit, said sleeve having a portion of enlarged internal dimension at said one end thereof providing an internal surface extending transversely of the axis of said sleeve intermediate the ends thereof with said end portion of enlarged internal dimension of said sleeve together with the external surface of said free end portion of said conduit defining a chamber in communication with said opening through said sidewall of said conduit, said chamber being open at one end of said sleeve and closed at the other end of said sleeve; and,

(e) means for resiliently urging said one end of said sleeve into compressive seating engagement with said outwardly extending flange means, the area of compressive seating engagement between said one end of said sleeve and said flange means being equal to at least a substantial portion of the cross-sectional area of said chamber.

4,160,736

ROTATING TRICKLING FILTER

David G. Prosser, Mequon, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.

Filed Oct. 11, 1977, Ser. No. 840,532

Int. Cl.[2] C02C *1/04*

U.S. Cl. 210—150 **9 Claims**

1. A rotating trickling filter comprising:

a hollow, elongated, imperforate, circular cylindrical shell;

a wastewater inlet at one end of said shell;

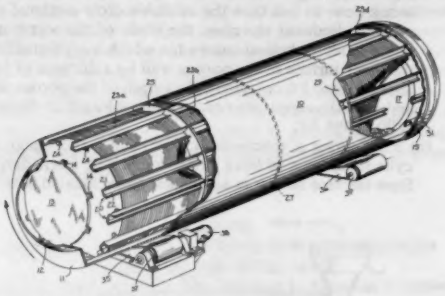
a treated water outlet at the opposite end of said shell;

means for rotating said shell;

longitudinally extending wastewater lifting means disposed adjacent the inner surface of said shell;

fixed film contactor media mounted within said shell between the inlet and outlet means; and

means for maintaining a low level of wastewater in said shell so that a shallow pool of wastewater is formed at the bottom of said shell and through which said lifting means



sweeps to pick up and subsequently discharge wastewater over said media as the shell is rotated.

4,160,737

FLOTATION AND PLATE SEPARATION DEVICE

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands

Continuation of Ser. No. 665,930, Mar. 11, 1976, abandoned, which is a continuation of Ser. No. 532,329, Dec. 13, 1974, abandoned. This application Sep. 21, 1977, Ser. No. 835,336

Claims priority, application Netherlands, Dec. 22, 1973, 7317649

Int. Cl.[2] B01D *21/10*

U.S. Cl. 210—202 **14 Claims**

1. A purification device for treating a liquid material including a carrier liquid having particles therein to effect separation of the particles from said carrier liquid, comprising:

means forming a tank including a supply chamber for said liquid material and a discharge chamber for the carrier liquid and a portion of said particles,

plate separation means positioned within said tank to receive flow of the liquid material therein and communicating at one end with said supply chamber and at the other end with said discharge chamber, said plate separation means having an upper surface extending laterally from a wall of said supply chamber and beneath the surface of the liquid material in said supply chamber to form a corner within said supply chamber, said corner defining a space widening laterally upwardly to progressively reduce the flow velocity through said supply chamber,

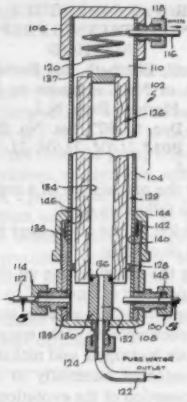
means forming a supply duct for said liquid material and including an opening communicating with said corner of said supply chamber,

means for removing floating particles from the surface of the liquid material in said supply chamber,

means forming a source of pressurized gas in a liquid and including a pump to pressurize said liquid and gas and a pressure reducing valve connected to receive flow from said pump, and

injection nozzle means connected to receive flow from said valve and positioned in said corner of said supply chamber, the pressurized gas and liquid being depressurized upon flow through the valve to form a mixture of gas bubbles in the liquid for admixture with the liquid material in said supply chamber to remove a portion of said particles by flotation prior to flow of the liquid material through said plate separator.

4,160,738
WATER PURIFICATION DEVICE AND SYSTEM
Gerald A. Guter, 215 Via Socorro, San Clemente, Calif. 92672
Filed May 16, 1977, Ser. No. 796,852
Int. Cl.[2] B01D *27/08*
U.S. Cl. 210—232 16 Claims



1. A water purification device which comprises at least two cooperating structural elements forming a housing containing an enclosed chamber, sealing means positioned between said structural elements, a cap compressing said sealing means and holding said at least two elements together, a fluid inlet to said chamber, a waste fluid outlet and a product fluid outlet from said chamber, at least one filter means positioned in said chamber, at least one additional mechanical connection maintaining said at least two structural elements in secure sealed engagement during operation under high internal fluid pressures, said at least one filter means being a tubular reverse osmosis filter, said filter constructed and arranged within said housing to provide an annulus between the outer surface of said reverse osmosis filter and the inner surface of said housing, a second sealing means within said annulus and preventing flow of inlet water through said annulus and past said second sealing means, said filter having one edge disposed in said chamber so that inlet water entering said chamber and said one edge of said filter passes through said filter and is treated therein, and pure water is discharged interiorly through said filter and waste water is discharged exteriorly of said filter in said annulus on the other side of said second sealing means from said inlet water, and forming a waste water chamber, and means closing one end of the bore of said tubular reverse osmosis filter to provide a pure water chamber separate from the inlet water introduced for purification, said product fluid outlet communicating with the other end of said bore and said pure water chamber therein, said waste fluid outlet communicating with said waste water chamber in the annulus exteriorly of said filter.

4,160,739
POLYOLEFINIC COPOLYMER ADDITIVES FOR LUBRICANTS AND FUELS
Robert L. Stambaugh, Hatboro, and Richard A. Galluccio, Perkasie, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
Filed Dec. 5, 1977, Ser. No. 857,079
Int. Cl.[2] C10M *1/32, 3/26;* C10L *1/14;* C08L *23/00*
U.S. Cl. 252—34 26 Claims

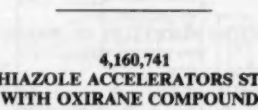
1. A composition comprising a major amount of a lubricating oil and a minor detergent amount of a graft copolymer comprising an oil soluble, substantially linear, substantially saturated, rubbery, olefinic hydrocarbon backbone polymer and graft polymerized thereon, copolymerized units of a monomer system comprising maleic acid or maleic anhydride and one or more other monomers copolymerizable with maleic acid or maleic anhydride, said copolymerized units being post-reacted with a polyamino compound having one reactive primary or secondary amino group.

4,160,740
INHIBITED AQUEOUS, METHOXYPROPANOL COOLANT ADJUSTED TO A pH BETWEEN ABOUT 6 AND 9
Forest H. Sweet, III, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed Oct. 17, 1977, Ser. No. 842,651
Int. Cl.[2] C09K *5/00*
U.S. Cl. 252—75 13 Claims

1. An aqueous, methoxypropanol based coolant composition inhibited against corrosion of metals and against degradation of fluoroelastomers, which composition comprises the reaction product of:
(A) about 1–70 parts by weight of one of 1-methoxy-2-propanol, 2-methoxy-1-propanol, or mixtures thereof;
(B) about 30–98 parts by weight of water;
(C) about 0.01–30 parts by weight of a phosphoric acid;
(D) about 0.01–30 parts by weight of sodium hydroxide, potassium hydroxide or mixtures thereof;
wherein the pH of the composition is adjusted to between about 6 and about 9 by balancing the relative amounts of components (C) and (D) to attain said pH.

4,160,741
BENZOTHIAZOLE ACCELERATORS STABILIZED WITH OXIRANE COMPOUNDS
Curtis A. Franz, Piscataway, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Jul. 11, 1977, Ser. No. 814,601
Int. Cl.[2] C08C *4/00;* C07D *277/78, 277/80;* C08K *5/47*
U.S. Cl. 252—182 6 Claims

1. A stabilized accelerator composition for rubber comprising (1) a benzothiazole having the formula



wherein R and R^1 are, individually, hydrogen alkyl of 1–8 carbon atoms, inclusive, cycloalkyl of 5–6 carbon atoms, inclusive, or, taken with the nitrogen, combine to form a morpholine, piperidine or pyrrolidine heterocyclic ring, and n is 0 or 1 and (2) an effective stabilizing amount of a solid or liquid oxirane compound having a molecular weight greater than 60 which is free of interfering functional groups.

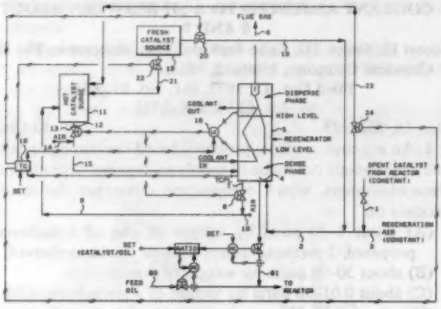
4,160,742
METHOD OF RESOLVING OIL-IN-WATER EMULSIONS
Manjeri S. Raman, Houston, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.
Filed Jun. 15, 1978, Ser. No. 916,034
Int. Cl.[2] B01D *17/04*
U.S. Cl. 252—344 5 Claims

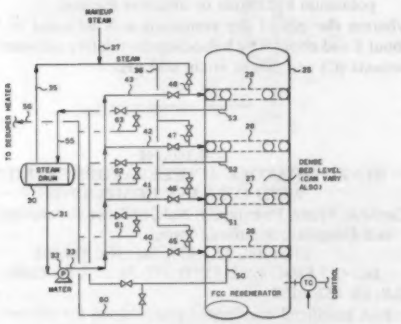
1. A method of breaking oil-in-water emulsions which comprises the steps of treating the emulsion with at least a deemulsifying amount of a copolymer of acrylamide and methacrylamidopropyl trimethylammonium chloride where said copolymer is at least 50% by weight acrylamide.

4,160,743
CONTROLLING A REGENERATION OF FLUIDIZED PARTICLES OR CATALYSTS

Carl S. Kelley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 30, 1978, Ser. No. 873,580
Int. Cl.[2] B01J *21/20, 29/38;* C10G *13/18, 35/14*
U.S. Cl. 252—411 R **7 Claims**





1. A method for controlling the temperature of a regeneration at an elevated temperature of a mass of particles maintained in a dense phase of a fluidized bed in a generation zone, which comprises providing an auxiliary or surge zone, maintaining in said surge zone a dense phase of a mass of said particles, continuously and simultaneously circulating a portion of said mass of particles from within each of said beds, in said regeneration zone and in said surge zone, to within the bed of the other zone, and controlling the temperature within the bed of said mass of said particles in said fluidized bed in said regeneration zone, by increasing the level of the bed in said regeneration zone when the temperature therein is tending to rise by adjusting the circulation of particles between said zones to build up the level in the regeneration zone, and vice versa.

4,160,744
CATALYST FOR REDUCTION OF NITROGEN OXIDES AND METHOD FOR MANUFACTURE THEREOF

Akira Watanabe; Tetsuya Sugimoto, both of Okayama, and Yasuhiro Makino, Bizen, all of Japan, assignors to Kyushu Refractories Co., Ltd., Bizen, Japan

Filed Mar. 6, 1978, Ser. No. 883,842
Claims priority, application Japan, Jun. 10, 1977, 52-67781
Int. Cl.[2] B01J *21/02, 23/74, 27/02*
U.S. Cl. 252—440 **11 Claims**

1. A catalyst for use in the reduction of nitrogen oxides; which comprises (1) at least one iron-containing substance selected from the group consisting of iron hydroxides, ores having iron hydroxide as their principal component and products obtained by calcining said hydroxides and ores at a temperature not exceeding 700° C. and (2) a material composed mainly of aluminum sulfate, the surface of said iron-containing substance being coated with said material, and said catalyst having an iron content of from 25 to 80% by weight as Fe_2O_3.

4,160,745
METHOD OF PREPARING HIGHLY ACTIVE NICKEL CATALYSTS AND CATALYSTS PREPARED BY SAID METHOD

Lawrence L. Murrell, Elizabeth, and David J. C. Yates, West Millington, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 1, 1977, Ser. No. 856,262
Int. Cl.[2] B01J *21/04, 21/08, 21/12, 23/74*
U.S. Cl. 252—466 J **24 Claims**

1. A process for the preparation of a supported nickel catalyst comprising the following steps:

(a) depositing nickel nitrate on an inert inorganic refractory oxide support or carbon;

(b) decomposing the nickel nitrate on the support to nickel oxide at a temperature of from 100° to 270° C. in a flowing gaseous atmosphere which gaseous atmosphere is characterized as not decomposing at the temperature utilized and does not contain hydrogen, said nickel nitrate decomposition being conducted essentially to completion as indicated by the cessation of the evolution of nitrogen oxides;

(c) reducing the nickel oxide on the support of step (b) to nickel metal on the support under a reducing atmosphere at a temperature of from 230° to 350° C.

4,160,746
CATALYST FOR HYDROGENATION OF ACETOPHENONE

Jay A. Rashkin, Piscataway, N.J., assignor to Malcon Research & Development Corporation, New York, N.Y.

Filed May 23, 1978, Ser. No. 908,610
Int. Cl.[2] B01J *23/02, 23/06, 23/26, 23/72*
U.S. Cl. 252—468 **9 Claims**

1. A method of preparing a catalyst for the liquid phase hydrogenation of acetophenone to phenyl methyl carbinol comprising:

(a) blending a barium-copper chromite powder produced by the calcination of a barium-copper ammonium chromate powder with predetermined amounts of $MgCrO_4$ and a zinc compound and sufficient water to form a paste;

(b) drying the paste of (a) at a temperature in the range of about 50°–200° C. in air, followed by calcination of said dried paste at a temperature in the range of about 200°–400° C. in air.

4,160,747
ELECTRODE AND MANUFACTURING METHOD THEREFOR

Gerhard Schneider; Werner Riedl, and Hans-Martin Lippold, all of Ellwangen, Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 410,282, Oct. 26, 1973, abandoned.
This application Jan. 27, 1978, Ser. No. 872,917
Int. Cl.[2] H01B *1/08*
U.S. Cl. 252—506 **8 Claims**

1. A method of manufacturing a positive electrode body for a primary cell with alkaline electrolyte comprising the steps of

forming a first mixture of manganese dioxide, and graphite in proportions of active mass and conductive material for the mass, respectively;

forming a dispersion in water only of polyisobutylene;

forming a second mixture of the first mixture and the dispersion;

and molding the second mixture into the positive electrode body.

4,160,748

NON-LINEAR RESISTOR

Masatada Yodogawa; Susumu Miyabayashi; Yoshinari Yamashita; Takashi Yamamoto; Kohji Hayashi, and Hisayoshi Ueoka, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1977, Ser. No. 863,922
Claims priority, application Japan, Jan. 6, 1977, 52/495
Int. Cl.[2] H01B *1/08*
U.S. Cl. 252—518 6 Claims

1. A non-linear resistor devoid of bismuth oxide and having a high value and high load life stability comprising a sintered body of a ceramic composition, which comprises: 99.93 to 50 mole % of zinc oxide as ZnO; 0.01 to 10 mole % of a specific rare earth oxide selected from the group consisting of oxides of lanthanum, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium as R_2O_3; 0.01 to 10 mole % of an alkaline earth oxide selected from the group consisting of oxides of calcium, strontium and barium as MO; 0.05 to 30 mole % of cobalt oxide as CoO and 0.01 to 1 mole % of a specific tetravalent element oxide $M'O_2$ selected from the group consisting of oxides of silicon, germanium, tin, titanium, zirconium, hafnium and cerium.

4,160,749

PROCESS FOR DISSOCIATING POLYURETHANE RESINS

Gottfried Schneider; Kuno Wagner, both of Leverkusen, and Werner Dietrich, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,536
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711145
Int. Cl.[2] B29H *19/00*
U.S. Cl. 260—2.3 12 Claims

1. In a process for dissociating cellular and noncellular polyurethane resins into re-usuable starting products for the isocyanate polyaddition process, wherein the polyurethane is reacted with associates of lactams and adductformers having at least two Zerewitinoff-active hydrogen atoms at from 150 to 250° C., optionally at elevated pressure, the improvement wherein from 35 to 1000 parts, by weight, based on 100 parts, by weight, of the polyurethane, of an associated mixture of:

(a) from 4 to 50 parts, by weight, of a lactam or azalactam, based on 100 parts, by weight, of polyurethane; and a mixture of:

(b) water and/or compound having a molecular weight of from 62 to 200 having at least two Zerewitinoff-active hydrogen atoms; and

(c) a polyhydroxyl compound having a molecular weight of from 300 to 6000; is used, and the proportion by weight of components (b) to (c) is from 1:10 to 10:1, and wherein said component (a) is used in a quantity such that said 35 to 1000 parts comprises from 4 to 50 parts of component (a).

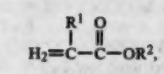
4,160,750

AQUEOUS ACRYLIC CONTACT CEMENT

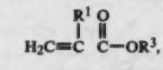
Peter S. Columbus, Whitestone, and John Anderson, Brooklyn, both of N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Feb. 22, 1977, Ser. No. 770,517
Int. Cl.[2] C08L *1/00*
U.S. Cl. 260—17.4 ST 10 Claims

1. Contact cement for adhering like and unlike surfaces which is prepared from the ingredients comprising acrylic ester polymer selected from soft monomers having the following formula:



hard monomers having the following formula



and mixtures thereof, where R^1 is H or an alkyl group of 1 to 4 carbon atoms, R^2 is alkyl group containing from 1 to 14 carbon atoms and R^3 is an alkyl group containing 1 to 20 carbon atoms; about 0.002 to 0.5% of epoxy silane; about 0.0008 to 0.2% of a material selected from the group consisting essentially of glyoxal, formaldehyde paraformaldehyde and mixtures thereof; and sufficient amount of a thickener to give the desired consistency; amounts herein being based on 100 dry parts of the acrylic polymer.

8. Contact cement prepared from 98 to 99.75% of Rhoplex CA-12 acrylic emulsion which contains about 52% solids, 0.25 to 2% of a 3% aqueous solution of a thickener, 0.002 to 0.01% of a 40% aqueous solution of glyoxal and 0.002 to 0.01% of an epoxy silane, where the silane and glyoxal synergistically improve water resistance and adhesion of the cement without interfering with shelf stability and freeze/thaw property thereof.

4,160,751

LOW PRESSURE INJECTION MOLDABLE COMPOSITIONS

Jan Bock, Houston, Tex.; Robert D. Lundberg, Bridgewater, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,765
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23.5 A 27 Claims

1. An elastomeric composition having a viscosity at 0.73 sec^{-1} at 200° C. of less than about 8×10^4, and greater than 5×10^3 poises, said composition injection moldable into an elastomeric article, which consists essentially of:

(a) a neutralized sulfonated elastomeric polymer having a viscosity at 0.73 sec^{-1} at 200° C. of about 3×10^5 poises to about 5×10^6 poises and about 15 to about 50 meq. neutralized metal sulfonate groups per 100 grams of said neutralized sulfonated elastomeric polymer;

(b) about 25 to about 150 parts by weight of a non-polar process oil per 100 parts by weight of said neutralized sulfonated elastomeric polymer, said non-polar process oil having less than about 2 wt. % polar type compounds therein;

(c) about 25 to about 300 parts by weight of an inorganic filler per 100 parts by weight of said neutralized sulfonated elastomeric polymer, said inorganic filler being selected from the group consisting of clay, talc, and calcium carbonate and mixtures thereof, a ratio of said inorganic filler to said non-polar process oil being about 0.6 to about 1.25, and

(d) at least 8 parts by weight of a preferential ionic plasticizer per 100 parts by weight of said neutralized sulfonated elastomeric polymer, said preferential plasticizer having a melting point of at least 25° C. and is selected from the group consisting of carboxylic acids having about 5 to about 30 carbon atoms and salts of said carboxylic acids and mixtures thereof, an ion of said salt being selected from the group consisting of aluminum, ammonium, lead, Cd, Hg, and Groups IA, IIA and IB of the Periodic Table of Elements.

4,160,752

PROCESS FOR MAKING CLOSURE SEALING COMPOUNDS AND OTHER LATEX BASED PREPARATIONS

Robert H. Akiyama, Scituate, and Leo B. Towle, Bedford, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Nov. 8, 1976, Ser. No. 739,462

Int. Cl.[2] C08J *3/20*

U.S. Cl. 260—27 BB 6 Claims

1. A process for preparing a polymer composition for use as water based film-forming compositions or as a water-based closure sealing composition comprising a resin component, particulate non-plastic materials and a natural or synthetic diene rubber latex, said process consisting of the sequential steps of

(a) liquifying the resin component by heating to a temperature between about 150° to 210° F.,

(b) mixing the particulate non-plastic materials into the resin at high shear rates while maintaining the resin in the liquified state whereby the particulate non-plastic materials is substantially totally incased in the resin,

(c) dispersing the mixture from step (b) with an aqueous medium, to form an emulsion, and

(d) blending the natural or synthetic diene rubber latex in the aqueous emulsion to form a water-based closure sealing composition.

4,160,753

PROCESS FOR THE PRODUCTION OF POLYAMIDE-POLYUREAS AND DISPERSIONS THEREOF IN WATER

Otto Lorenz, Roetgen-Rott, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 592,589, Jul. 2, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 848,970

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1974, 2436017

Int. Cl.[2] C08G *18/32, 18/30;* C08J *3/02*

U.S. Cl. 260—29.2 TN 11 Claims

1. A process for the production of linear, segmented, polyamide ureas having carboxyl groups which are situated directly on the main chain and which are non-statistically arranged comprising reacting polyisocyanates with primary and/or secondary polyamines in the presence of tetracarboxylic acid dianhydrides at a temperature of from 10° to 100° C., the reactants being selected in such a way that from 0.05 to 0.6 acid anhydride groups and from 0.4 to 4 NCO-groups are used per amino group.

8. A process for the production of aqueous dispersions of linear, segmented, polyamide ureas having carboxyl groups which are situated directly on the main chain and which are non-statistically arranged, said polyamide ureas produced by reacting polyisocyanates with primary and/or secondary polyamines in the presence of tetracarboxylic acid dianhydrides at a temperature of from 10° to 100° C., the reactants being selected in such a way that from 0.05 to 0.6 acid anhydride groups and from 0.4 to 4 NCO-groups are used per amino group, said process comprising converting the carboxyl groups of the polyadduct into carboxylate groups by at least partial neutralization, and dispersing the resulting polyadduct, containing ionic groups, in water.

4,160,754

STABLE POLYMER GELS

Dietmar Schäpel, Cologne; Kuno Wagner, Leverkusen; Hanns P. Müller, Leverkusen, and Manfred Dahm, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 886,316

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713198

Int. Cl.[2] C08L *61/24*

U.S. Cl. 260—29.4 R 12 Claims

1. Gels which are stable in storage, comprising a polymer matrix, a liquid dispersing agent embedded therein and optionally fillers or additives, characterized in that said polymer matrix is a polycondensation product from aldehydes and aminoplast-formers, at least 30% by weight of the aminoplast-formers having a molecular weight of between 200 and 10,000 and containing at least one functional group selected from the group consisting of ether, thioether, acetal, ester, urethane and carbonate groups.

4,160,755

PROCESS FOR PRODUCING ANISOTROPIC DOPES AND ARTICLES THEREOF FROM BENZOIC ACID DERIVATIVE POLYMERS

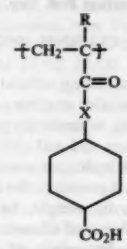
Eui W. Choe, Randolph; Marshall Tan, Ridgefield Park, both of N.J., and Robert M. Mininni, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,281

Int. Cl.[2] C08L *33/08, 33/10*

U.S. Cl. 260—29.6 H 11 Claims

1. A process for preparing an anisotropic dope which is useful in the production of fibers and films comprising: dissolving a polymer having recurring units of the formula



wherein R is hydrogen or methyl and X is oxygen or —NH, in an aqueous solution of at least one of the members of the group consisting of Group I metal compounds and compounds containing a protonated amine group.

4,160,756

USE OF METAL COMPOUND IN AN AUTODEPOSITION COATING COMPOSITION

Takao Nishida, and Kiyoshi Tonoike, both of Osaka, Japan, assignors to Amchem Products, Inc., New York, N.Y.

Division of Ser. No. 720,033, Sep. 2, 1976, Pat. No. 4,103,049, which is a continuation of Ser. No. 446,032, Feb. 26, 1974, abandoned. This application May 5, 1978, Ser. No. 903,047

Claims priority, application Japan, Mar. 2, 1973, 48-25469

Int. Cl.[2] B05D *1/18;* C23F *7/00*

U.S. Cl. 260—29.6 M 17 Claims

1. An acidic aqueous coating composition comprising about 5 to about 550 g/l of solid resin particles, and of pH within the range of about 1.6 to about 5 and prepared from hydrofluoric acid, and about 0.025 to about 50 g/l of a metal-containing compound which is soluble in said composition, the metal of said compound selected from the group consisting of silver, iron in its divalent state, copper in its divalent state, cobalt in its divalent state, chromium in its trivalent state, cadmium, tin in

its divalent state and lead in its tetravalent state, said composition being effective in forming on said metal surface a resinous coating which increases in weight or thickness the longer said surface is immersed in said composition.

4,160,757

ADHESIVE COMPOSITION

Toshio Honda, Akigawa; Yukio Fukuura, Kodaira; Shoji Tanaka, Higashi-Yamato; Itsuo Tanuma, Tokorozawa; Yoshikatsu Suzuki, Higashi-Murayama, and Hikaru Ishikawa, Kokubunji, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1977, Ser. No. 772,882
Claims priority, application Japan, Feb. 28, 1976, 51-21363
Int. Cl.[2] C08K *5/09;* C08L *9/00, 27/00, 63/00*
U.S. Cl. 260—31.2 N 13 Claims

1. An adhesive composition prepared by mixing
(a) an acrylonitrile-containing copolymer having carbon-to-carbon double bond
(b) a phenol-polysulfide resin
(c) a metal oxide, and
(d) a polyfunctional electrophilic reactive compound containing at least two electrophilic reactive groups and containing at least one radical selected from the class consisting of isocyanate group, epoxy group, carbonyl halide group and sulfonyl halide group.

12. An adhesive composition as claimed in claim 1, in which the adhesive composition is prepared by compounding a) component, b) component and c) component at first to form a rubber composition by dissolving the composition in a solvent and by reacting the solution with d) component.

4,160,758

METHOD OF MANUFACTURE OF ELASTOMER POLYESTER MOLDING COMPOUNDS

Irwin J. Gardner, Scotch Plains, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 30, 1978, Ser. No. 873,102
Int. Cl.[2] C08G *63/52;* C08J *3/20*
U.S. Cl. 260—40 R 10 Claims

1. A method for preparing an elastomer modified thermosetting unsaturated polyester molding compound having improved surface appearance, toughness and impact strength comprising preparing a first paste component comprising a mixture of an unsaturated polyester component, a free radical polymerizable monomer component, and an inorganic particulate filler component, preparing a second paste component comprising a mixture of a conjugated diene butyl elastomer copolymer component, a free radical polymerizable monomer component and an inorganic particulate filler component, and combining said first and second paste components.

4,160,759

ELASTOMER MODIFIED POLYESTER MOLDING COMPOUND

Irwin J. Gardner, Scotch Plains, N.J., and Francis P. Baldwin, Coupleville, Wash., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 30, 1978, Ser. No. 873,103
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—40 R 12 Claims

1. An elastomer modified thermosetting unsaturated polyester molding compound having improved surface appearance, toughness and impact strength comprising an unsaturated polyester component, a conjugated diene butyl elastomer copolymer component said copolymer consisting of from 85 to 99.5% by weight of a C_4-C_7 isoolefin combined with 15 to 0.5% by weight of a C_4-C_{14} conuugated diolefin and said copolymer containing randomly distributed sites of conjugated diene unsaturation, a free radical polymerizable monomer component, and an inorganic particulate filler component.

4,160,760

PROCESS FOR PREPARING POLYACRYLONITRILE DOPED WITH PRUSSION BLUE

Stephen H. Carr, and Samuel I. Stupp, both of Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

Filed Aug. 22, 1977, Ser. No. 826,419
Int. Cl.[2] C08K *3/02, 5/16;* D06P *1/00, 3/70*
U.S. Cl. 260—42.21 6 Claims

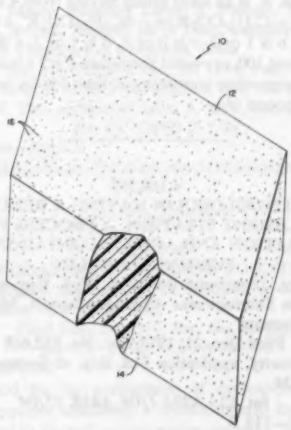
1. A method for reacting color agents selected from the group consisting of hydrated metal cyanide complexes, and iodine with polyacrylonitrile homopolymers and copolymers to provide a polymer solid exhibiting enhanced electrical properties and color characteristics, said method comprising the steps of:
a. preparing a polymer solution of acrylonitrile polymer in a solvent selected from the group consisting of dimethyl formamide and dimethyl sulfoxide at a concentration below 20 weight-percent polymer,
b. preparing an aqueous dispersion of an additive selected from the group consisting of hydrated metal cyanide complexes, iodine and mixtures thereof at a concentration below 0.1 Molar,
c. agitating said polymer solution while slowly adding thereto said aqueous dispersion to provide a substantially homogeneous fluid system,
d. evaporating said fluid system to remove said solvent and water therefrom, to provide a homogeneous, colored solid comprising an acrylonitrile polymer containing the additive distributed therethrough as an essentially molecularly dispersed phase.

4,160,761

PLASTIC ARTICLES

Richard C. Prusinski, and Jan R. Prusinski, both of Dearborn, Mich., assignors to Architectural Research Corporation, Livonia, Mich.

Filed May 4, 1978, Ser. No. 902,668
Int. Cl.[2] C08J *5/00*
U.S. Cl. 260—42.47 3 Claims



1. A plastic article comprising fabricated of a filled thermoplastic resinous material, said filled thermoplastic resinous material comprising recycled thermoplastic resinous material intermixed with solid waste particles, said thermoplastic resinous material having as one component acrylonitrile-butadiene-styrene in an amount of 40% to 60%, by weight, based on the weight of the resinous material, and as a second component vinyl plastic in an amount of from 40% to 60%, by weight, based on the weight of the resinous material, said resinous material having mixed therein solid waste particles and additional amounts of silica sand, said fill material, including both

the solid waste particles and silica sand, being present in an amount from 40% to 60%, by weight, based upon the weight of the resinous material.

4,160,762

HALOGEN-CONTAINING RESIN STABILIZER COMPRISING AN ALKOXYCARBONYLALKYLENETIN SULFIDE

Motonobu Minagawa, Koshigaya, and Tetsuo Sekiguchi, Hasuda, both of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jun. 14, 1977, Ser. No. 806,528
Claims priority, application Japan, Jun. 14, 1976, 51-69456
Int. Cl.² C08K 5/58
U.S. Cl. 260—45.75 S 18 Claims

1. A stabilizer composition for enhancing the resistance to deterioration upon heating of a halogen-containing resin comprising (A) at least one sulfide compound of four-valent tin having linked to a tin atom at least one sulfide group and through carbon from one to two alkoxycarbonylalkylene groups having from 1 to 8 carbon atoms in the alkoxy group and from 2 to 3 carbon atoms in the alkylene group and represented by the formula

$$[S_d(C_bH_{2b}CO_2)_cSn_d(C_eH_{2e}CO_2R)_2]_n$$

and (B) at least one tin mercaptoalkylenecarboxylic acid ester having linked to a tin atom through sulfur from 2 to 3 mercaptoalkylenecarboxylic acid alkyl ester groups and 4 to 18 carbon atoms in the alkyl ester group, and through carbon from 1 to 2 alkoxycarbonylalkylene groups having from 1 to 8 carbon atoms in the alkoxy group and from 2 to 3 carbon atoms in the alkylene group and represented by the formula

$$ROOCC_eH_{2e}Sn(SC_bH_{2b}CO_2R')_2R''$$

in which formulae R is an alkyl group having from 1 to 8 carbon atoms, R' is an alkyl group having from 4 to 18 carbon atoms, R'' is $-C_eH_{2e}CO_2R$ or $-SC_bH_{2b}CO_2R'$, a is an integer from 1 to 4, b is 1 or 2, c is 0 or 1, d is 1 or 2, e is 2 or 3, n is from 1 to about 100, provided that when d is 2 a is at least 3, the stabilizer composition containing at least 5% by weight of the sulfide compound (A).

4,160,763

IMMUNOGLOBULIN HAVING A REDUCED COMPLEMENT FIXATION, A PROCESS FOR ITS PREPARATION AND AGENTS CONTAINING THIS IMMUNOGLOBULIN

Hans Müller, Dautphetal-Buchneau, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 862,668
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658334
Int. Cl.² A23J 1/06; A61K 37/04
U.S. Cl. 260—112 B 17 Claims

1. A method for making an immunoglobulin preparation having reduced complement activity, which method comprises treating an immunoglobulin fraction with at least one member selected from the group consisting of (1) sulfitolytic agents and (2) phosphates which are sparingly soluble in water, said treatment with a sulfitolytic agent proceeding for 5 to 90 hours at a temperature not substantially higher than about 50° C. and at a concentration of said sulfitolytic agent which is less than $5(10^{-2})$ mole/liter, and said treatment with a phosphate being at a concentration of phosphate from 0.005 mole/liter to 0.15 mole/liter.

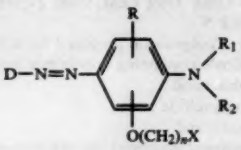
4,160,764

WATER-INSOLUBLE MONOAZO-DYESTUFFS FOR SYNTHETIC FIBROUS MATERIALS

Peter Mischke, Neuenhain; Erwin Fleckenstein, Hofheim, and Reinhard Mohr, Offenbach am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

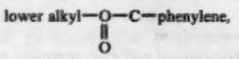
Continuation of Ser. No. 692,728, Jun. 4, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 894,177
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1975, 2525557
Int. Cl.² C09B 29/26, 31/08
U.S. Cl. 260—206 5 Claims

1. Azo-dyestuff of the formula



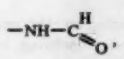
in which

D represents nitrophenylene,



dinitro-phenylene, nitro-cyano-phenylene, nitro-chloro-phenylene, nitro-bromo-phenylene, trichloro-phenylene, nitro-dichloro-phenylene, dinitro-chloro-phenylene, dinitro-cyano-phenylene, nitro-bromo-cyano-phenylene and dinitro-bromo-phenylene,

R represents hydrogen, chlorine, lower alkyl, lower alkoxy, —O—CH_2—CN, —NH—CO-lower alkyl, —NH—COO lower alkyl or



n stands for the integer 1 or 2, X represents cyano, —CO—NH_2 or —COO-lower alkyl, R_1 represents hydrogen, lower alkyl, lower alkylene-OH, lower alkylene-CN, lower alkylene-OCO-lower alkyl or lower alkenyl, and R_2 represents lower alkyl, lower alkylene-O-CO-lower alkyl or lower alkylene-COO-lower alkyl.

4,160,765

METHOD FOR 6-BROMINATION OF 1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE COMPOUNDS

Joseph Weinstock, Phoenixville, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 17, 1976, Ser. No. 742,965
Int. Cl.² C07D 223/16
U.S. Cl. 260—239 BB 1 Claim

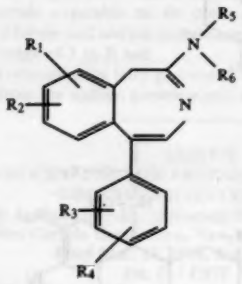
1. The method of preparing a 6-bromo-7,8-dimethoxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine hydrobromide comprising the step of reacting a 6-hydrogen-7,8-dimethoxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepine with about two mole equivalents of bromine in acetic acid at ambient temperature.

4,160,766
AMINO CONTAINING BENZAZEPINES

John B. Bream, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed May 17, 1978, Ser. No. 906,838
Claims priority, application United Kingdom, May 23, 1977, 21619/77
Int. Cl.[2] C07D *223/16*; A61K *31/55*; C07D *413/04*
U.S. Cl. 260—243.3 19 Claims

1. A compound of formula I,



I

wherein either

R_1 is hydrogen, halogen, trifluoromethyl or lower alkyl or alkoxy, and

R_2 is hydrogen or lower alkoxy, or

R_1 and R_2 together are methylenedioxy,

R_3 is hydrogen, halogen, trifluoromethyl, or lower alkyl or alkoxy or alkylsulphonyl,

R_4 is hydrogen, halogen, or lower alkyl or alkoxy, and either

(i)

R_5 is hydrogen, lower alkyl or hydroxyalkyl, lower alkyl mono-substituted by cycloalkyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, lower alkenyl or alkynyl, wherein the multiple bond is in other than the α,β-position, or phenylalkyl of 7 to 10 carbon atoms, and

R_6 is hydrogen, lower alkyl or hydroxyalkyl, or

(ii)

R_5 and R_6 together with the nitrogen atom to which they are bound are 1-piperidinyl, 1-pyrrolidinyl, 1-morpholinyl, 1-piperazinyl or 1-(4-lower alkyl)-piperazinyl,

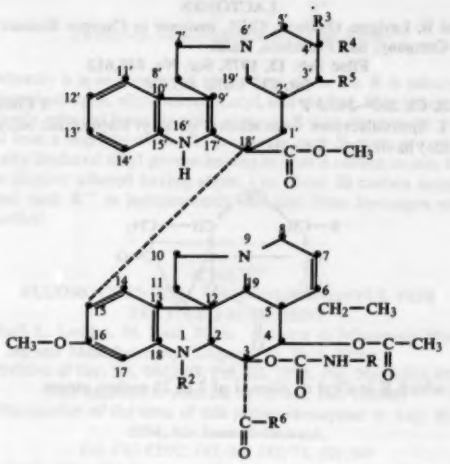
in free base form or in pharmaceutically acceptable acid addition salt form.

4,160,767
VINCA ALKALOID INTERMEDIATES

Jean C. Miller, and Gerald E. Gutowski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 869,546, Jan. 16, 1978, abandoned, which is a division of Ser. No. 747,575, Dec. 6, 1976, Pat. No. 4,096,148. This application Aug. 21, 1978, Ser. No. 935,431
Int. Cl.[2] C07D *519/04*
U.S. Cl. 260—244.4 1 Claim

1. A compound of the formula



III

wherein R is C_1–C_4 alkyl, C_3–C_4 alkenyl, CH_2—CHX—CH_3 or CH_2—CH_2X wherein X is Cl or Br;

R^2 is H, CH_3 or CHO;

one of R^3 and R^4, when taken singly, is H or OH and the the other is ethyl;

R^5, when taken singly, is H;

R^4 and R^5 taken together form an epoxide ring; and

R^6 is OCH_3 or NH_2.

4,160,768
ANTI-INFLAMMATORY 3-BENZOFURANYL IMIDAZOTHIAZOLE

Robert E. Moser, Mentor; Larry J. Powers, Madison, and Zaven S. Ariyan, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 755,276, Dec. 29, 1976, Pat. No. 4,110,451, which is a division of Ser. No. 650,318, Jan. 19, 1976, Pat. No. 4,041,167. This application Mar. 2, 1978, Ser. No. 882,573
Int. Cl.[2] C07D *277/08*
U.S. Cl. 260—306.7 T 1 Claim

1. 3-(2-Benzofuranyl)-5,6-dihydro-4H-imidazo-[2,1-b] thiazole.

4,160,769
OXIDATION OF KETONES TO ESTERS

David P. Higley, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,924
Int. Cl.[2] C07D *313/04, 309/08*
U.S. Cl. 260—343 12 Claims

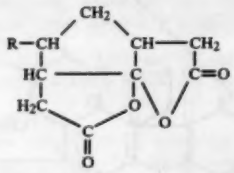
1. Method for the preparation of cycloaliphatic lactones which comprises oxidizing a cycloaliphatic ketone, having from about 5 to about 7 carbon atoms inclusive, with hydrogen peroxide and a catalytic amount of a selenium compound, having a valence of +4, selected from the group consisting of selenium dioxide, selenious acid, alkali metal salts of selenious acid, selenium halides, selenium oxyhalides, and dialkyl selenites having 1 to about 10 carbon atoms in each alkyl moiety, in the presence of at least 0.1 equivalent weights, per equivalent weight of selenium compound, of a base having a conjugate acid with a dissociation constant in the range of about 5×10^{-8} to about 8×10^{-2}, in an inert solvent whereby the oxidation by +6 valence selenium of said aliphatic ketone is inhibited, at a temperature of about 20° C. to about 200° C.

4,160,770
LACTONES

Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 13, 1975, Ser. No. 549,612
Int. Cl.[2] C07C 493/04
U.S. Cl. 260—343.3 P 1 Claim

1. Spirodilactones from alkenyl or alkyl bis(succinic anhydride) having the formula



in which R is alkyl or alkenyl of 2 to 28 carbon atoms.

4,160,771
SYNTHESIS OF TETRAHYDROFURAN

Paul D. Taylor, Clinton, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 632,343, Nov. 17, 1975, Pat. No. 4,105,678. This application Nov. 3, 1977, Ser. No. 848,122
The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.
Int. Cl.[2] C07D 307/08
U.S. Cl. 260—346.11 3 Claims

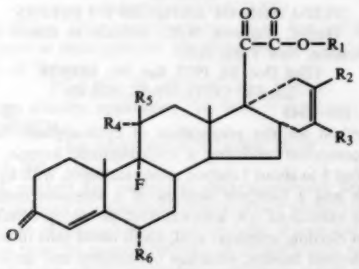
1. A process which comprises hydrogenating 4-hydroxybutanal in an aqueous reaction medium maintained at a pH between about 0.2 and 3 to yield tetrahydrofuran.

4,160,772
STEROIDAL[16α,17-D]CYCLOHEXENE-21-CARBOXYLIC ACID ESTERS

Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

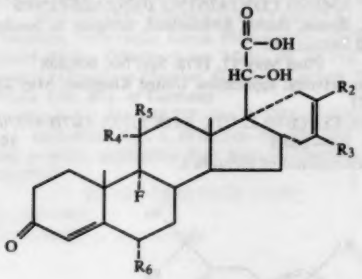
Filed Jun. 26, 1978, Ser. No. 919,006
Int. Cl.[2] C07J 5/00
U.S. Cl. 260—397.1 16 Claims

1. A steroid having the formula

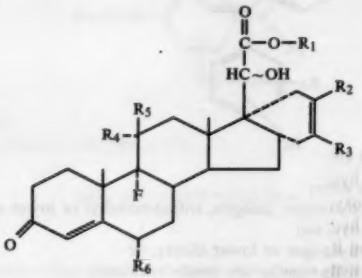


or the 1,2-dehydro derivative thereof, wherein R_1 is alkyl of 1 to 10 carbon atoms, aryl or arylalkyl; R_2 and R_3 are the same or different and are hydrogen, alkyl or aryl; R_4 is hydrogen and R_5 is hydroxy or together R_4 and R_5 are =O; and R_6 is hydrogen, methyl or fluorine.

16. A steroid having the formula



or



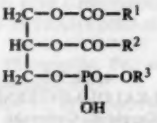
or the 1,2-dehydro derivative thereof, wherein R_1 is alkyl of 1 to 10 carbon atoms, aryl or arylalkyl; R_2 and R_3 are the same or different and are hydrogen, alkyl or aryl; R_4 is hydrogen and R_5 is hydroxy or together R_4 and R_5 are =O; and R_6 is hydrogen, methyl or fluorine.

4,160,773
SYNTHETIC ALKYL ESTERS OF PHOSPHOLIPID ACID, STRUCTURAL ANALOGS THEREOF AND A PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Hansjörg Eibl, Bovenden; Walter Diembeck, Gottingen, and Stephan Kovatchev, Gottingen-Roringen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Continuation of Ser. No. 602,030, Aug. 5, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,735
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1974, 2437833
Int. Cl.[2] A23J 7/00; C07F 9/02; C11C 3/00
U.S. Cl. 260—403 3 Claims

1. An alkyl ester of a phospholipid acid of the formula



wherein R^1 and R^2 are the same or different and each stands for a substituted or unsubstituted alkyl of 5 to 25 carbon atoms or haloalkyl of 6 to 25 carbon atoms and R^3 is alkyl of 6 to 18 carbon atoms.

3. The compound sn-1,2-dimyristoyl glycerol-3-phosphoric acid hexyl ester.

4,160,774

PROCESS OF DEGUMMING FATTY GLYCERIDES USING SODIUM ACETATE AND ACETIC ACID BUFFER

Raghuram D. Shenoy, and Ananthram Ganapathy, both of Bombay, India, assignors to Cadbury India Limited, Bombay, India

Filed Jan. 25, 1978, Ser. No. 872,183
Int. Cl.[2] C11B 3/04
U.S. Cl. 260—424 4 Claims

1. A process for degumming fatty glycerides which comprises the steps of:

(a) adding sodium acetate and acetic acid buffer to molten crude vegetable sal fat containing the fatty glycerides wherein said sodium acetate-acetic acid buffer is in the pH range of 3 to 5; and

(b) removing the fatty glycerides degummed during step (a) from the sodium acetate-acetic acid buffer solution.

4,160,775

PROCESS FOR THE PREPARATION OF NOVEL ORGANOSILICON COMPOUNDS

Curtis L. Schilling, Jr., Croton-on-Hudson, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,970
Int. Cl.[2] C07F 7/08
U.S. Cl. 260—448.2 E 27 Claims

1. Process of making an organofunctional siloxane having bonded to silicon at least one monovalent group of the formula

$$-CH_2CH(R^*)CH_{3-m}X_m$$

wherein R^* is a monovalent hydrocarbon group, X is a hydrocarbonoxy group, a cyanohydrocarbonoxy group, an acyloxy group, a halogen atom, a hydroxy group, a cyano group or a group having the formula $—OC(O)NR_2$ wherein R is a monovalent nitrogen-free organic radical, a divalent hydrocarbon group when both R's are taken together or hydrogen and may be the same or different throughout the same group or molecule, when X is halogen, hydroxy, cyano or a group of the formula $—OC(O)NR_2$, m is an integer of 1 and, when X is hydrocarbonoxy, cyanohydrocarbonoxy or acyloxy, m is 1 or 2, comprising subjecting a substituted allyl compound having the formula:

$$CH_2=C(R^*)CH_{3-m}X_m$$

wherein X and m are as defined above and an organosiloxane having at least one silicon-bonded hydrogen to addition reaction conditions under which said silicon-bonded hydrogen and the silicon to which it is bonded become bonded respectively to the vicinal carbon atoms comprising the unsaturation of said substituted allyl compound, said organosiloxane and said substituted allyl compound having no groups that would interfere with said addition reaction and no groups, other than substituted allyl groups of said substituted allyl compound and silicon bonded hydrogen, that react under said addition reaction conditions, with the proviso that, when X is halogen, hydroxyl or cyano, the substituted allyl compound is added incrementally to said organosiloxane which is maintained at said addition reaction conditions.

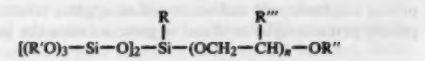
4,160,776

ALKOXY-BIS (TRIALKOXYSILOXY)-SILANE SURFACTANTS

Michael Scardera, Hamden, and David F. Gavin, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 29, 1978, Ser. No. 920,579
Int. Cl.[2] C07F 7/18
U.S. Cl. 260—448.8 R 17 Claims

1. A surfactant composition having the formula:



wherein n is an integer of about 5 to about 50; R is selected from hydrogen, alkyl, alkenyl, aryl, and aralkyl; R′ is independently selected from the same group as R with the proviso that at least a majority of the R′ groups on each Si atom are sterically hindered alkyl groups having at least 3 carbon atoms; R″ is alkyl or alkenyl having about 1 to about 20 carbon atoms; and each R‴ is independently selected from hydrogen and methyl.

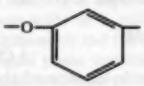
4,160,777

FLUOROCHEMICAL COMPOUND USEFUL FOR TEXTILE TREATMENT

Basil L. Loudas, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 446,003, Feb. 26, 1974, Pat. No. 4,043,923.
This application Jan. 14, 1977, Ser. No. 759,467
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.[2] C07C 143/68, 143/74, 101/04
U.S. Cl. 260—456 F 4 Claims

1. A fluorochemical compound having the formula $(R_fQ)_e(XCO)_mA(COOM)_p$ where R_f is fluorinated aliphatic radical having from three to twenty carbon atoms and containing about 40–78 weight percent carbon-bonded fluorine, "Q" is a divalent linking radical selected from the group consisting of $—(CH_2)_n—$, $—SO_2NR_1(CH_2)_n—$, $—(CH_2)_nCOOCH_2CH_2—$, $—SO_2NR_1(CH_2CH_2O)_nCH_2CH_2$, $—SO_2(C_2H_5)C_2H_4NHC_2H_4—$ and $—SO_2$



wherein "R_1" is hydrogen or a lower alkyl group having from about 1 to 14 carbon atoms and "n" is an integer from about 1 to 15, "M" is a cation selected from NH_4^+, Na^+, K^+, Li^+, H^+ or is a protonated alkyl amine having from 1–6 carbon atoms in the alkyl group, "A" is a polyvalent organic radical having a valency of m+p and is the residue obtained by eliminating the carboxyl groups of a polybasic organic acid or an organic anhydride and is selected from the group consisting of maleic, succinic, phthalic, tetrachlorophthalic, chlorendic, tetrabromophthalic, 3-nitrophthalic, 4-nitrophthalic, cis 1,2-cyclohexane dicarboxylic, 5-norborene-2,3-dicarboxylic, 1,8-naphthalene dicarboxylic and benezophenone tetracarboxylic and pyromellitic, "X" is NR (wherein R is hydrogen or an alkyl group of from 1 to 14 carbon atoms), or N and "e", "p" and "m" are integers of 1 or 2.

4,160,778

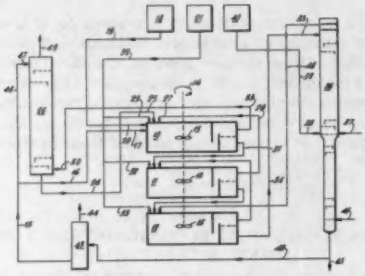
EPOXIDATION

Anthony M. Hildon, Tattenhall; Thomas D. Manly, Runcorn, and Alan J. Jaggers, Rainhill, all of England, assignors to Propylox a Society Anonyme, Brussels, Belgium

Filed Jan. 30, 1978, Ser. No. 873,523
Claims priority, application United Kingdom, Feb. 26, 1977, 8246/77
Int. Cl.[2] C07C 179/10
U.S. Cl. 260—502 R 9 Claims

1. In a continuous process for the preparation of a peracid which comprises reacting, in a reaction zone, hydrogen peroxide with an unsubstituted monocarboxylic acid having from 2 to 6 carbon atoms in an aqueous medium containing sulfuric acid to form a percarboxylic acid, and extracting the percarboxylic acid thus formed into an organic phase comprising an

organic solvent, thereby to produce an aqueous solution comprising sulphuric acid and water and an organic solution comprising percarboxylic acid and organic solvent, the improvement wherein the hydrogen peroxide is added to the reaction mixture at a plurality of locations in the reaction zone, thereby to limit the concentration of hydrogen peroxide at any location in the reaction zone.



4,160,779

PROCESS FOR THE PRODUCTION OF METHYLAMINOMETHYLPHOSPHONIC ACID AND ITS SALTS

Ludwig Maier, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

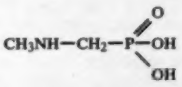
Filed Oct. 10, 1978, Ser. No. 949,829

Claims priority, application Switzerland, Oct. 12, 1977, 12455/77

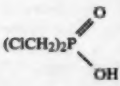
Int. Cl.² C07F 9/38

U.S. Cl. 260—502.5 3 Claims

1. A process for the production of methylaminomethylphosphonic acid of the formula



and the salts thereof, which comprises reacting bis(-chloromethyl) phosphinic acid



in water or an aqueous medium, with ammonia at 100°–200° C. and under autogenous pressure, and isolating the methylaminomethylphosphonic acid from the reaction mixture in the form of the free acid or of a salt.

4,160,780

2-KETOPENTAFLUOROPROPANESULFONIC ACID AND RELATED ACIDS

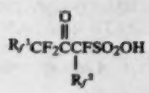
Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1975, Ser. No. 602,756

Int. Cl.² C07C 143/08

U.S. Cl. 260—513 F 2 Claims

1. A ketopolyfluorosulfonic acid of the formula



where F_f^1 and R_f^2, alike or different, are F or perfluoroalkyl of up to 4 carbons.

4,160,781

4-BENZYLOXY-3-(CHLOROCARBONYL)-PHENYLACETYL CHLORIDE

Arthur R. McFadden, East Brunswick; Richard C. Allen, Flemington, and Thomas B. K. Lee, Whitehouse Station, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 843,482, Oct. 19, 1977, Pat. No. 4,118,401. This application Sep. 5, 1978, Ser. No. 939,263

Int. Cl.² C07C 63/00

U.S. Cl. 260—544 D 1 Claim

1. 4-benzyloxy-3-(chlorocarbonyl)phenylacetyl chloride.

4,160,782

PROCESS FOR TREATING UREA BODIES

Willy Henri P. Van Hijfte, Assenede, and Rafael Arsene J. Goethals, Ertvelde, both of Belgium, assignors to Compagnie Neerlandaise de l'Azote, Brussels, Belgium

Continuation of Ser. No. 168,754, Aug. 3, 1971, abandoned. This application Jan. 9, 1978, Ser. No. 868,183

Claims priority, application United Kingdom, Aug. 6, 1970, 38046/70

Int. Cl.² C07C 126/00

U.S. Cl. 260—555 C 22 Claims

1. A process for treating urea pellets, prills and like urea bodies to reduce their tendency to cake, which comprises treating said urea bodies with an aqueous solution containing an effective amount of trimethylol urea, which solution contains about 2 to about 5 mol of bonded and free formaldehyde per mol of urea.

4,160,783

4-DEDIMETHYLAMINO-4-ARYLSULFONAMIDO-5A,6-ANHYDROTETRACYCLINES

Marica Čakara; Slobodan Djokić, and Zrinka Tamburasev, all of Zagreb, Yugoslavia, assignors to PLIVA Pharmaceutical and Chemical Works, Yugoslavia

Filed Nov. 28, 1977, Ser. No. 855,496

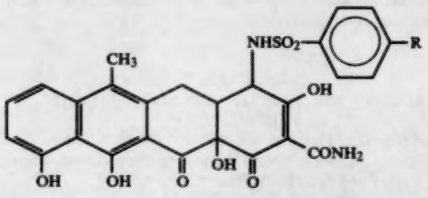
Claims priority, application Yugoslavia, Nov. 26, 1976, 2901/76

Int. Cl.² C07C 143/79; A61K 31/18

U.S. Cl. 260—556 AR 10 Claims

1. A 4-dedimethylamino-4-arylsulfonamido-5a,6-anhydrotetracycline of the formula I

(I)



wherein R stands for C_1–C_3-alkyl, halogen or —NHCOR¹, and R¹ being C_1–C_3-alkyl.

4,160,784

PROCESS FOR THE PRODUCTION OF o-AMINOPHENYL KETONE DERIVATIVES

Tsutomu Sugasawa, Kobe; Tatsuo Toyoda, Osaka; Makoto Adachi, Izumi, and Kazuyuki Sasakura, Oumihachiman, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Feb. 18, 1977, Ser. No. 770,037
Claims priority, application Japan, Feb. 18, 1976, 51-16677
Int. Cl.[2] C07C 85/18
U.S. Cl. 260—570 AB 7 Claims

1. Process for the production of o-aminophenyl ketone derivatives which comprises reacting an aniline unsubstituted in at least one ortho position with a nitrile in the presence of boron trihalogenide to introduce a substituted iminomethyl into the ortho position of said aniline and hydrolyzing the resulting iminomethyl compound.

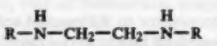
4,160,785

REDUCTION OF DIIMINO COMPOUNDS TO DIAMINO COMPOUNDS

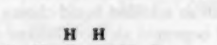
Jimmy L. Webb, Ballston Lake, N.Y., and John E. Corn, Mt. Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 544,139, Jan. 27, 1975, abandoned. This application Jul. 1, 1976, Ser. No. 701,517
Int. Cl.[2] C07C 85/08
U.S. Cl. 260—583 P 4 Claims

1. The process for making diamino compounds of the formula



which consists essentially of (1) hydrogenating a preformed imino compound of the formula



in a methanol solvent and in the added presence of a tertiary alkyl mono-amine of the formula $R—NH_2$ which is used to increase the yield of the diamino compound, the tertiary alkyl mono-amine being present in a molar ratio of from 0.2 to 4.0 mols of the latter per mol of the imino compound, where R in the diimino compound and in the mono-amine is the same and is a monovalent alkyl hydrocarbon of from 4 to 10 carbon atoms containing a tertiary

group connected directly to the nitrogen atoms of the mono-amine or the imino compound, and where R′ is a member of the class consisting of the methyl radical, the ethyl radical, and mixtures thereof, thereby to form the aforesaid diamino compound, and (2) recovering the above-described diamino compound from the reaction mixture.

4,160,786

PROCESS FOR ISOMERIZING CYCLOALKENOL TO CYCLOALKANONE

William J. Ehmann, Orange Park, Fla., assignor to SCM Corporation, New York, N.Y.

Filed Aug. 11, 1978, Ser. No. 933,058
Int. Cl.[2] C07C 45/00, 45/16
U.S. Cl. 260—586 P 12 Claims

1. A process for isomerizing a beta-, gamma-unsaturated cycloalkenol to a cycloalkanone, wherein said cycloalkenol is contaminated with an acid-forming moiety capable of causing dehydration of said cycloalkenol, which comprises:

forming a reaction mixture of said cycloalkenol, a catalytic amount of copper chromite catalyst, and between about 0.01% and 10% by weight of said cycloalkenol of a base which has a solubility in said reaction mixture not substantially above about 5 millimoles per gram of said catalyst, said base rendering said moiety substantially incapable of causing said dehydration,

heating said reaction mixture at about 150° to 300° C. until said cycloalkanone is formed; and

recovering said cycloalkanone from said reaction mixture.

4,160,787

PROCESS FOR EXTRACTING BITTER FLAVORING PRINCIPLES FROM HOPS

Manfred Moll; Roland Flayeux, both of Vandoeuvre; Pierre Dicesare, Frouard, and Bernard Gross, Villers les Nancy, all of France, assignors to G.I.E. Tepral, France

Filed Mar. 31, 1976, Ser. No. 672,461
Claims priority, application France, Apr. 2, 1975, 75 11278; Dec. 16, 1975, 75 39611
Int. Cl.[2] C07C 45/00, 45/16, 45/24
U.S. Cl. 260—586 D 8 Claims

1. A process of treating hops for the preparation of bitter flavoring extracts for food products and fermented beverages which comprises the steps of

(a) subjecting a purified hop extract containing alpha and beta-acids to a direct isomerization treatment of the alpha-acids by mixture thereof with magnesium ethoxide suspended in anhydrous ethanol, said mixture being shielded from light and refluxed under nitrogen,, with agitation, at a temperature of the order of 80° C. and atmospheric pressure to form isoalpha-acids;

(b) effecting a separation of the iso-alpha acids from the beta-acids in a pulsed column wherein the isomerized alpha-acids and the beta-acids are intermixed in an organic liquid phase containing the acids and are contacted in a pulsed column with an inorganic aqueous liquid phase comprising alkali metal carbonates or phosphates in solution, said pulsed column effecting the separation by internal dispersion of the two phases, the iso-alpha acids transferring into the aqueous liquid phase and the beta acids remaining in the organic liquid phase;

(c) isolating the resultant iso-alpha acids;

(d) transforming the separated beta-acids into alpha-acids by ultraviolet radiation at 3500–3600 A, at a temperature between 10° and 50° C. to form a desoxy-alpha-acid and then oxidation of said desoxy-alpha-acid by a per-acid in a basic medium at a pH of 10–12, at a temperature of less than 25° C., said per-acid being selected from the group consisting of mono-persulfuric acid, p-nitro-perbenzoic acid and peracetic acid;;

(e) then treating the alpha acid from (d) in another magnesium ethoxide isomerization (as in a) to obtain iso-alpha acids in free form in the form of the magnesium salt of said iso-alpha-acids.

4,160,788

DISPROPORTIONATION OF TOLUENE

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,457
Int. Cl.[2] C07C 3/62
U.S. Cl. 585—475 6 Claims

1. A process for effecting disproportionation of toluene to produce benzene and xylenes in which the preparation of para-xylene isomer is in excess of its normal equilibrium concentration which comprises contacting toluene under conditions effective for accomplishing said disproportionation in the presence of a catalyst comprising the crystalline aluminosilicate zeolite ZSM-23.

4,160,789

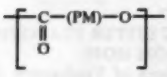
BLOCK COPOLYMERS

Pierino Radici, Turate; Gaudenzio Bianchi, Fagnano Olona, and Paolo Colombo, Saronno, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

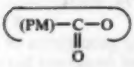
Filed Oct. 22, 1976, Ser. No. 734,932
Claims priority, application Italy, Oct. 30, 1975, 28810 A/75
Int. Cl.[2] C48G *2/38*
U.S. Cl. 525—411 5 Claims

1. A block copolymer of the structure A-B wherein:

A is a polylactone block consisting of a chain of recurring units:



obtained from one or more lactone monomers of the formula:



wherein PM is a linear polymethylene chain having from 2 to 13 carbon atoms, non substituted or substituted by having at least one hydrogen atom replaced by a radical selected from the group consisting of the alkyl, aryl, aralkyl, cycloalkyl and alkylenyl radicals,

B is a polyoxymethylene block consisting of recurring units $+CH_2-O+$, the said block B being present in the copolymer in an amount of at least 2% by weight and the said block A being present in the copolymer in an amount of at least 0.1% by weight.

4,160,790

HIGH IMPACT NYLON MOLDING COMPOSITIONS

Charles D. Mason, Chatham Township, Morris County, and Paul W. Flood, Lake Hopatcong, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 3, 1977, Ser. No. 821,380
Int. Cl.[2] C08L *77/00*
U.S. Cl. 525—179 4 Claims

1. In a melt-blended composition of nylon-6 or nylon 66, as 60–98 percent by weight of the composition, blended with a copolymer of ethylene containing from 1–20 mol percent in the copolymer of randomly distributed units of acrylic acid or ethyl ester thereof: the improvement which comprises such blend containing both a copolymer of ethylene with such acid and a copolymer of ethylene with such ester at weight proportions, between the acid and ester copolymers, from 2 parts of acid copolymer: 12 parts ester copolymer up to 16 parts of acid copolymer: 5 parts ester copolymer by weight, whereby the notched Izod impact resistance of the composition is higher than for a like composition in which either one of the copolymers is substituted for the said blend of both copolymers.

4,160,791

POLYCARBONATE MEMBRANES AND PRODUCTION THEREOF

Willard S. Higley, Glendora; Paul A. Cantor, Los Angeles, and Bruce S. Fisher, Covina, all of Calif., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 636,062, Nov. 28, 1975, Pat. No. 4,075,108, which is a continuation-in-part of Ser. No. 454,939, Mar. 26, 1974, abandoned. This application Jan. 30, 1978, Ser. No. 873,168
Int. Cl.[2] C08L *69/00*
U.S. Cl. 525—469 9 Claims

1. A process for producing a polyether-polycarbonate block copolymer having a molecular weight within the range of from about 50,000 to about 750,000 as determined by the intrinsic viscosity measurement and containing from about 5 to about 35 percent by weight of repeating alkylene ether units and correspondingly from about 95 to about 65 percent by weight of repeating bisphenol A-carbonate units for use in forming membranes comprising:

dissolving a polyether glycol compound, bisphenol A, and pyridine in a solvent to give a total solids content of about 5 percent to about 16 percent, by weight, reacting the dissolved bisphenol A, polyether glycol compound, and pyridine with phosgene by adding phosgene, at an initial feed rate, to said solution with vigorous stirring while maintaining the solution in the temperature range of about 20° C. to about 43° C. until crystals of pyridine hydrochloride begin to form;

thereafter adding a chain terminator to the reacted solution and reducing the phosgene feed rate to about one-fiftieth of initial phosgene rate until the reaction solution undergoes a permanent color change, thereafter precipitating said polyether-polycarbonate block copolymer by mixing the reaction solution with an acidified liquid chosen from the group consisting of isopropyl alcohol, hexane and a 80:20 by volume mixture of acetone and water, and separating the precipitated polymer from the liquid.

4,160,792

THERMOPLASTIC MOLDING COMPOSITION COMPRISING STYRENE-MALEIMIDE AND POLYCARBONATE

Ronald A. Fava, Monroeville, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 794,496, May 6, 1977, Pat. No. 4,122,130. This application Oct. 10, 1978, Ser. No. 949,604
The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.
Int. Cl.[2] C08L *67/06*
U.S. Cl. 525—148 5 Claims

1. A thermoplastic molding composition which comprises:

A. from about 10% to about 90% by weight of a polycarbonate;

B. from about 10% to about 90% by weight of a copolymer of maleimide and styrene containing from about 5% to about 35% maleimide and from about 65% to about 95% styrene.

4,160,793

FIRE RETARDANT BLEND OF INTERPOLYMER COMPOSITION, CHLORINATED VINYL CHLORIDE POLYMER AND VINYL CHLORIDE POLYMER

Paul Kraft, South Spring Valley, and Joseph Silberberg, Brooklyn, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 28, 1978, Ser. No. 937,230
Int. Cl.[2] C08L 33/20
U.S. Cl. 525—230 6 Claims

1. A fire retardant blend having good impact resistance and a high heat deflection temperature comprising:

(1) a predominant amount of an interpolymer comprising: (a) crosslinked acrylate or methacrylate; (b) crosslinked styrene-acrylonitrile; and (c) uncrosslinked styrene-acrylonitrile components, said interpolymer being prepared by polymerizing styrene and acrylonitrile in the presence of a cross-linked alkyl acrylate or methacrylate polymer in two steps with at least one cross-linking agent being present in only one of the two steps;

(2) a chlorinated vinyl chloride polymer; and

(3) a vinyl chloride polymer.

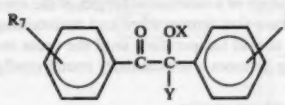
4,160,794

1-OXO-2,2-[DIALKYLPHOSPHONO(ALKYL)ALKYLOXY]-1,2-DIPHENYLETHANE

Andreas Schmidt, Reinach, and Rudolf Kirchmayr, Munchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 642,230, Dec. 19, 1975, Pat. No. 4,082,821.
This application Jan. 9, 1978, Ser. No. 867,992
Claims priority, application Switzerland, Dec. 24, 1974, 017285/74; Dec. 26, 1975, 015304/75
Int. Cl.[2] C07F 9/40
U.S. Cl. 260—927 R 9 Claims

1. A compound of formula I



(I)

wherein

x represents a phosphonoalkyl group of formula

$$-(CH_2)_nP(O)(OR_1)(OR_2);$$

Y represents a phosphonoalkyl group of the formula

$$-CH(R_5)-CH(R_6)-P(O)(OR_3)(OR_4)$$

or a phosphonoalkoxy group of formula

$$-O-(CH_2)_nP(O)(OR_3)(OR_4);$$

each of R_1, R_2, R_3 and R_4 independently represents alkyl of 1 to 4 carbon atoms, haloalkyl of 2 to 3 carbon atoms, alkoxyalkyl of 3 to 8 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, aralkyl of 7 to 8 carbon atoms, phenyl, halogeneophenyl, alkylphenyl or alkoxyphenyl, or R_1 and R_2 together, or R_3 and R_4 together, represent a branched or unbranched alkylene of 2 to 7 carbon atoms;

each of R_5 and R_6 independently represents hydrogen, alkyl of 1 to 4 carbon atoms or phenyl;

each of R_7 and R_8 independently represents hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen or phenyl; and

n is 2 or 3.

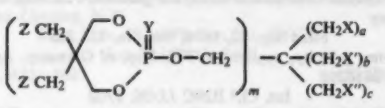
4,160,795

DURABLE FLAME RETARDANT FOR POLYESTER TEXTILE MATERIALS

James A. Albright, and Richard R. Nicholson, both of Ann Arbor, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jan. 13, 1978, Ser. No. 869,084
Int. Cl.[2] C07F 9/165, 9/08
U.S. Cl. 260—937 11 Claims

1. A compound of the formula



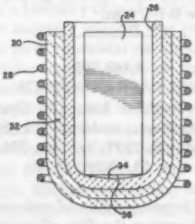
wherein each Z is independently selected from the group consisting of hydrogen and halogen; Y is oxygen or sulfur; n is an integer of from 1 to 3; a, b, and c are integers of from 0 to 1; n+a+b+c= 4; and wherein X, X', X" are independently selected from the group consisting of hydrogen, halogen, alkyl of 1 to about 8 carbon atoms and —OC(O)R, provided that at least one of said X, X', X" substituents is —OC(O)R, and R is independently selected from the group consisting of alkyl of 1 to about 18 carbon atoms, haloalkyl of 1 to about 18 carbon atoms, alkoxyalkyl of from 1 to about 18 carbon atoms, aryl of from 6 to about 18 carbon atoms, and haloaryl of from about 6 to about 18 carbon atoms.

4,160,796

MELTING FURNACE CONSTRUCTIONS

Nick G. Lirones, North Muskegon, Mich., assignor to Howmet Turbine Components Corporation, Muskegon, Mich.

Filed Oct. 31, 1977, Ser. No. 847,262
Int. Cl.[2] C04B 33/34
U.S. Cl. 264—60 7 Claims



1. A method for producing a crucible for use in melting a charge in a melting furnace, said furnace having heating means surrounding the crucible for melting the charge, and insulating means separating the crucible from the heating means, the insulating means including a ceramic liner adjacent said heating means, said method comprising forming said crucible by applying isostatic pressure to ceramic particles surrounding a core whereby the crucible may define an irregular exterior surface, casting a ceramic capsule around said crucible whereby the interior surfaces of the capsule closely conform to and are in contact with the exterior surfaces of said crucible, the casting of the ceramic capsule including the steps of providing a mold having interior dimensions corresponding with the interior dimensions of said liner, locating said crucible in said mold and casting ceramic particles in the mold for thereby forming said capsule around said crucible, the exterior dimensions of said capsule thereby being controlled by the mold configuration with the exterior dimensions of said capsule conforming with the interior dimensions of said liner whereby the capsule and crucible combination is snugly receivable

within said liner, and whereby the combination of said capsule and liner provide strong support for said crucible.

4,160,797

PROCESS FOR THE DEPOSITION OF POLYCRYSTALLINE SILICON FROM THE GAS PHASE ON HEATED CARRIERS

Alois Göppinger; Rudolf Griesshammer; Helmut Hamster, all of Burghausen, and Franz Köppl, Altötting, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Sep. 22, 1976, Ser. No. 725,223

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618293

Int. Cl.[2] B29C *13/00, 1/02*

U.S. Cl. 264—81 **7 Claims**

1. An improved process for the deposition of polycrystalline silicon from the gaseous phase on heated carrier bodies of graphite, by heating said bodies to deposition temperature while contacting them with a gaseous mixture containing a decomposable silicon compound and separating the deposited silicon from the carrier body after termination of the deposition process, wherein the improvement comprises: assembling the carrier bodies from thin flexible graphite foils having a thickness of between 0.1–2 mm.

4,160,798

RELEASE COATINGS

Lawrence Price, 63 Portland Ave., Old Orchard Beach, Me. 04064, and Mose A. Russo, Anderson Rd., Sebago, Me. 04075

Filed May 9, 1977, Ser. No. 796,714

Int. Cl.[2] B29D *7/02*

U.S. Cl. 264—213 **4 Claims**

1. In a method of forming a film of resinous material which includes the step of casting the film of resinous material in a flowable state onto a piece of paper having an easy release surface, drying the resinous film material and stripping it from the release surface, the improvement which comprises casting the film of resinous material onto a piece of paper having a release coating comprising a copolymer of an aliphatic 1-olefin having from 6 to 50 carbon atoms per molecule and maleic anhydride hydrolyzed with potassium hydroxide.

4,160,799

MAINTAINING PLANARITY IN POLYESTER FILM DURING UNIFORM TEMPERATURE HEAT RELAXATION

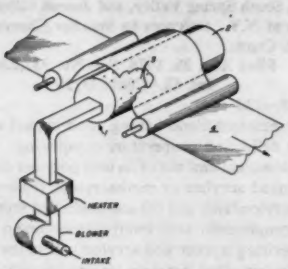
Mark M. Locey, and William F. Gottermeier, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 727,745, Sep. 29, 1976, abandoned. This application Apr. 19, 1978, Ser. No. 897,826

Int. Cl.[2] B29C *25/00*

U.S. Cl. 264—342 R **8 Claims**

1. A method of heat relaxing a biaxially-oriented heatset polyester film having a thickness from about 1 mil to about 7 mils, said method comprising heating said film at a uniform temperature sufficient to heat relax the film, while simultaneously subjecting the film to low tension in its longitudinal dimension and impinging gas on the film so as to buoy the film in a curved configuration free of straight segments along said



longitudinal dimension, said curved configuration having at least one curved segment defined by a radius of curvature within the range from about 1 inch to about 8 inches subtending an arc of no less than 40 degrees.

4,160,800

METHOD OF FORMING A COMPOSITE ROD

Kenneth E. Branen, Hudson, N.H., assignor to Avco Corporation, Wilmington, Mass.

Filed Aug. 5, 1977, Ser. No. 822,234

Int. Cl.[2] B29C *25/00*

U.S. Cl. 264—345 **6 Claims**

1. A method of forming a round composite rod from a flat composite strip comprising:

vertically suspending a flat composite strip containing longitudinally aligned monofilaments within a matrix that softens when heated;

raising the temperature of a substantial length of the composite strip to its transition temperature and maintaining the composite strip at said temperature until the cross section of the composite assumes a substantially round configuration; and

fully solidifying said composite.

4,160,801

HEAT EXCHANGER-BLOOD OXYGENATOR COMBINATION

Anthony Badolato, Willingboro, and Joseph S. Farrell, Piscataway, both of N.J., assignors to Surgikos, New Brunswick, N.J.

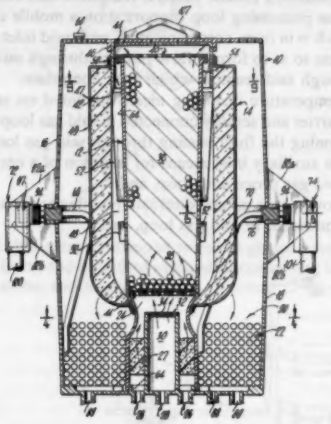
Filed Oct. 19, 1977, Ser. No. 843,626

Int. Cl.[2] A61M *1/03*

U.S. Cl. 422—46 **10 Claims**

1. A blood treatment apparatus comprising: an upper housing; a lower housing; a substantially cylindrical central housing supported at one end on the bottom wall of said lower housing and defining a blood oxygenation chamber therewithin; blood inlet means in said bottom wall for feeding blood to said central housing; oxygen inlet means in said bottom wall for feeding oxygen to said central housing; a blood reservoir in the lower portion of said lower housing surrounding said central housing for receiving oxygenated blood from said oxygenation chamber; blood outlet means in said bottom wall external of said central housing in communication with said blood reservoir for feeding oxygenated blood from said reservoir; a plurality of closely spaced heat-exchange coils located in said blood reser-

voir for regulating the temperature of said oxygenated blood; and an annular gasket separating said upper and lower housings and forming a seal therebetween; said coils having inlet and outlet ends extending through openings in said gasket.

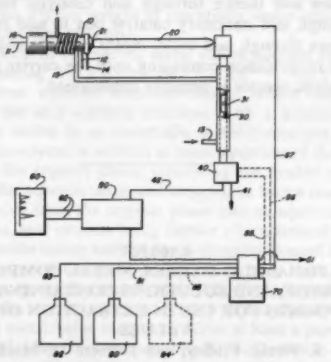


4,160,802

INSTRUMENT FOR THE AUTOMATED DETERMINATION OF ORGANIC HALOGENS

Robert H. White, Houston, Tex., and Lowell P. Hager, Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Feb. 23, 1978, Ser. No. 880,372
Int. Cl.[2] G01N *31/06, 31/12, 31/22*
U.S. Cl. 422—68 **5 Claims**



1. An instrument for the automated determination of organic halogen content comprising in series arrangement:

(a) an elongated combustion chamber, having an inlet end and an outlet end, for burning an organic halogen-containing sample in an oxygen-hydrogen flame;

(b) a burner, affixed via a seal to the inlet end of the combustion chamber, having means for introducing and atomizing the sample in a rapid flow of hydrogen gas, and means for supplying oxygen to the atomized sample for combustion;

(c) absorption means, affixed to the outlet end of the combustion chamber, including means for forming a supported moving film for absorbing the halogen-containing combustion gases, said film comprising a colorimetric reagent solution;

(d) means for collecting the halogen-containing reagent solution and venting therefrom inert, water-insoluble gases;

(e) colorimeter means, connected to the collection means, for receiving and monitoring the halogen content of the vented reagent solution; and

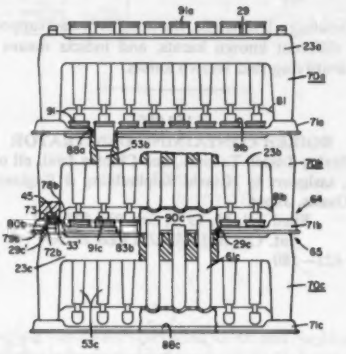
(f) pump means for transferring the reagent solution from storage vessels and establishing the moving liquid film.

4,160,803

SELF PACKAGED TEST KIT

Robert S. Potts, Sherborn, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 23, 1978, Ser. No. 889,218
Int. Cl.[2] B01L *9/00*
U.S. Cl. 422—101 **22 Claims**



1. A self-packaged structure for use as a test kit comprising: collection tubes and fraction columns supported in said structure in an array including: a plurality of racks each adapted for supporting the fraction columns and collection tubes and a tray adapted to receive a plurality of said racks therein in a vertical orientation and to securely support one rack adjacent to another in tandem to form a modular package; each of said racks comprising: a modular integral monolith including: dependent legs, and a horizontal support member joining upper portions of the legs, the support member having a plurality of through holes therein aligned adjacent one another between the legs, each hole having a shaped interior wall adapted to receive a selected one of the fraction columns and collection tubes in substantially upright fashion, upstanding lugs disposed on an upper surface of the support member and aligned with a lower horizontal support surface of the legs, the legs having complimentary recesses therein shaped for frictionally receiving the lugs of another of said racks to facilitate stacking of one rack over another, each tray including first means adapted for receiving at least one rack securing fraction columns therein and second means adapted for receiving at least one rack securing collection tubes therein, portions of the first and second means being spaced in said tray to mate with the lower horizontal support surface of the legs and further including, respective first and second surfaces aligned in selected spaced relation with the support member for the respective rack for supporting the fraction columns and collection tubes.

4,160,804

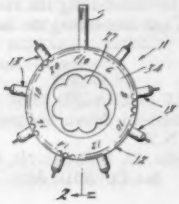
DEVICE FOR ASSAYING GOLD AND OTHER METALS

Thomas J. Victory, 25167 Harcourt, Farmington, Mich. 48024

Filed Aug. 2, 1978, Ser. No. 930,416
Int. Cl.[2] B01L *9/00*; G01N *31/00*
U.S. Cl. 422—104 **7 Claims**

1. A gold assaying device comprising a clam shell type of holder having facing halves mating at their peripheral edges, a plurality of radially extending apertured portions formed by

said mating edges, a plurality of needle supports, each support having a head within said peripheral edges and a body portion extending from one of said apertured portions, a bore in each



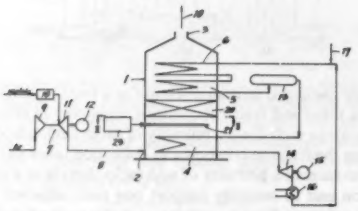
support holding a test needle, the needles in said supports being gold of different known karats, and indicia means on said holder identifying said known karats.

4,160,805

BOILER CONTAINING DENITRATOR

Hideya Inaba; Toshio Tatsumi, and Chihiro Iwai, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co. Ltd., Osaka, Japan

Filed Jul. 14, 1977, Ser. No. 815,539
Int. Cl.[2] B01J *8/02*; C01B *21/00*
U.S. Cl. 422—180 **7 Claims**



1. In a waste heat boiler having a superheater, an evaporator and an economizer disposed in a combustion gas channel formed therein, the improvement comprising, a denitration catalyst layer disposed between said superheater and said evaporator, said catalyst layer being constituted by a number of plate-like denitration catalyst bodies disposed with their plate surfaces extending along the direction of flow of combustion gas, and reductant feeding means for adding a reductant to the combustion gas provided between said catalyst layer and said superheater.

4,160,806

MOBILE CATALYST TREATMENT UNIT

Warner D. Long, 9112 Tiverton Way, Louisville, Ky. 40223; Charles C. Hager, Rt. 1, Box C F80, Crestwood, Ky. 40014, and George T. Hempenstall, 11104 Berwick Pl., Middletown, Ky. 40243

Filed May 9, 1977, Ser. No. 795,121
Int. Cl.[2] B01J *8/02, 37/12*; F25D *15/00*
U.S. Cl. 422—223 **11 Claims**

1. A catalytic gas treatment system which comprises in combination:

A. a catalytic reactor containing a stationary catalyst bed and having an inlet and an outlet means connected to other gas treatment units, and

B. a cutoff means in operative relation with said inlet means for isolating the catalytic reactor from the other gas treatment units,

C. a cutoff means in operative relation with said outlet means for isolating the catalytic reactor from the other gas treatment units,

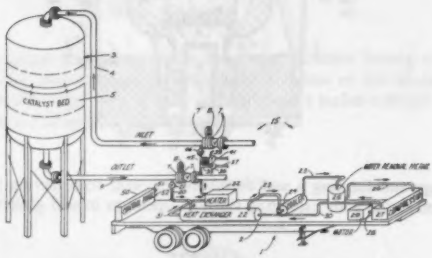
D. an auxiliary mobile catalyst treatment unit comprising:

E. a gas processing loop supported on a mobile carrier and which is in open communication with said inlet and outlet means so as to form a flow passage through said loop and through said reactor, which loop comprises:

a. temperature changing means mounted on said mobile carrier and serially connected in said gas loop for conditioning the fluid passing through said gas loop, and

b. an auxiliary inlet means for addition of a carrier gas to said gas processing loop, and

c. flow means mounted on said mobile carrier and serially connected in said gas loop, and



d. a first conduit at one end of said loop, detachably connected to said inlet means at a point between said cutoff means and said isolated catalytic reactor,

e. a second conduit at the other end of said loop, detachably connected to said outlet means at a point between said isolated catalytic reactor and said cutoff means,

F. whereby means are provided for establishing and recirculating a flow of carrier gas from said gas loop to said inlet means and thence through said catalytic reactor, and through said stationary catalyst bed in said reactor and thence through said outlet means back to said gas loop, said recirculation continuing until the carrier gas in said catalytic reactor is properly conditioned.

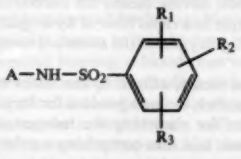
4,160,807

SULFONAMIDO OXIMES, METAL COMPLEXES THEREOF, AND SOLUTIONS CONTAINING SUCH COMPOUNDS FOR USE IN EXTRACTION OF METAL VALUES

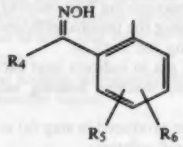
Michael J. Virnig, Fridley, and Kenneth D. MacKay, Circle Pines, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed May 24, 1978, Ser. No. 909,226
Int. Cl.[2] C07C *143/78, 143/79*; B01D *11/04*
U.S. Cl. 423—24 **83 Claims**

1. Compounds of the structure

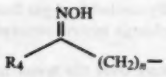


wherein A is a radical selected from the group consisting of



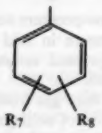
(a)

and



(b)

in which R_4 is a member selected from the group consisting of hydrogen, linear and branched chain alkyl containing from 1 to 20 carbon atoms and a radical of the structure



in which R_7 and R_8, which may be the same or different, are selected from the group consisting of hydrogen, linear and branched chain alkyl containing from 1 to 20 carbon atoms, halogen, nitro, nitrile, lower alkoxy and trifluoromethyl; R_5 and R_6, which may be the same or different, are selected from the group consisting of hydrogen, linear and branched chain alkyl containing from 1 to 20 carbon atoms, halogen, nitro, nitrile, lower alkoxy and trifluoromethyl; n is an integer of 1 or 2; and, R_1, R_2 and R_3, which may be the same or different, are selected from the group consisting of hydrogen and linear and branched chain alkyl containing from 1 to 20 carbon atoms; said compounds being further characterized as having solubilities of at least 2% by weight in essentially water-immiscible, liquid hydrocarbon solvents.

49. A process of recovering metal values selected from the group consisting of Cu^{++}, Ni^{++}, Zn^{++}, Co^{++} and Co^{+++}, from aqueous solutions thereof which comprises contacting the said aqueous solutions with a solution of a sulfonamido oxime in an essentially water-immiscible, liquid hydrocarbon solvent to extract at least a portion of the metal values into the organic phase, separating the loaded organic phase from the aqueous phase and stripping at least a portion of the metal value from the organic phase into an aqueous stripping medium, said process being further characterized in that said sulfonamido oxime and the metal complex thereof formed during the extraction step have solubilities of at least 2% by weight in the essentially water-immiscible, liquid hydrocarbon solvent and the starting aqueous solution is of composition and pH for each metal value such as to allow at least a portion of the said metal value to be extracted by the sulfonamido oxime.

4,160,808

PYROHYDROLYSIS PROCESS FOR SPENT ALUMINUM REDUCTION CELL LININGS

John N. Andersen, Moraga, and Norman Bell, Livermore, both of Calif.

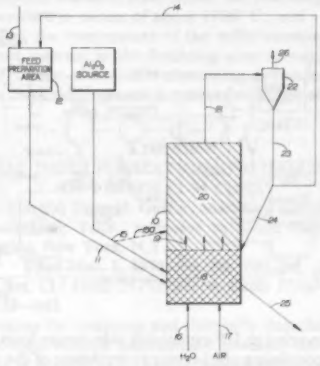
Filed May 30, 1978, Ser. No. 910,416
Int. Cl.[2] C01F 7/04; C01B 7/19
U.S. Cl. 423—119 **5 Claims**

1. In the process of recovering fluoridic values from spent and waste materials generated in electrolytic aluminum reduction systems by subjecting the materials to pyrohydrolysis in a fluidized bed reactor at a temperature of at least about 1100° C., the reactor having a bed of fluidized spent and waste materials and a freeboard area extending from the surface of the bed to the top of the reactor, the improvement which comprises:

(a) charging a relatively coarse charge of spent and waste materials to the fluidized bed, the charge having a particle size in the range of from about 2.0 mm to about 15.0 mm and a controlled Na to Al mole ratio of not less than about 0.7 and up to about 1.0;

(b) fluidizing and pyrohydrolyzing the coarse charge to generate an offgas containing volatilized fluoridic values including Na-containing vapors;

(c) establishing an extended reaction zone in the freeboard area of the reactor by charging a finely divided source of Al_2O_3 to the reactor to contact the offgases and in a manner so as to obtain an excess of Al in the Na:Al mole ratio in the freeboard area whereby essentially all of the Na-



containing vapors are converted to HF and $Na_2O.xAl_2O_3$, the relatively finely divided source of Al_2O_3 being characterized by an Al_2O_3 content of at least about 25% by weight and a particle size in the range of about 40 to about 500 microns and at least a portion of the finely divided source of Al_2O_3 being charged to the freeboard area;

(d) recovering an offgas stream from the reactor containing entrained solids, separating the solids from the gas and recycling at least a portion of the solids to the fluidized bed reactor; and

(e) recovering a solid clinker from the reactor having a controlled Na to Al mole ratio.

4,160,809

MODIFIED PYROHYDROLYSIS PROCESS FOR SPENT ALUMINUM REDUCTION CELL LININGS

John N. Andersen, Moraga, and Norman Bell, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jul. 24, 1978, Ser. No. 927,084
Int. Cl.[2] C01F 7/04; C01B 7/19
U.S. Cl. 423—119 **7 Claims**

1. In the process of recovering valuable components from carbon and fluoride-containing aluminous spent and waste materials generated in electrolytic aluminum reduction systems by subjecting the spent and waste materials to pyrohydrolysis in the presence of steam in a fluidized bed reactor having a fluidized bed and a freeboard area above the bed at a temperature within the range of about 900° C. to about 1300° C., the improvement comprising the combination of steps of

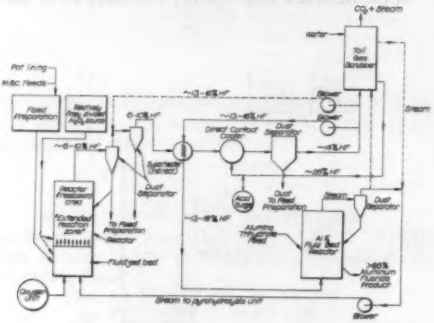
(a) combusting the carbon content of the spent and waste materials in the fluidized bed with an O_2-containing stream having an O_2 content of at least about 90% by volume thus generating a hot offgas substantially free of nitrogen and containing HF and vaporized Na-containing compounds;

(b) establishing an extended reaction zone in the freeboard area of the reactor by contacting the hot offgas with a relatively finely divided source of Al_2O_3 having a particle size within the range of about 40 to about 500 microns

whereby the Na-containing vapors are converted to HF and $Na_2O.xAl_2O_3$;

(c) cooling the hot, HF-containing offgas by direct contact with an aqueous HF-containing stream and conducting the cooled offgas to a scrubber for the removal of its HF content by scrubbing with an aqueous medium, while generating a steam and inert gas containing scrubbed offgas;

(d) recovering the aqueous HF from the scrubber and using at least a portion thereof for cooling hot HF-containing offgas generated in the fluidized bed reactor;



(e) recovering an HF-containing side stream from the cooled HF-containing offgas prior to scrubbing of the offgas with the aqueous medium and employing the HF-containing side stream for the production of an AlF_3 product of at least about 85% by weight AlF_3 content in a fluidized bed reactor using as alumina source alumina trihydrate; and

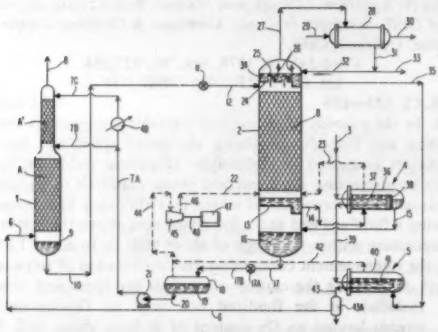
(f) recovering the AlF_3 product and steam from the AlF_3 reactor and recycling the steam to the pyrohydrolysis reactor.

4,160,810

REMOVAL OF ACID GASES FROM HOT GAS MIXTURES

Homer E. Benson, and Donald H. McCrea, both of Pittsburgh, Pa., assignors to Benfield Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1978, Ser. No. 884,200
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—220 **12 Claims**



1. In a cyclic process for the removal of acid gases from a feed gas stream consisting of a hot, steam-containing gas mixture by means of an aqueous alkaline scrubbing solution which is continuously recycled between an absorption stage in which said acid gases are absorbed by said scrubbing solution and a regeneration stage in which said acid gases are desorbed by steam-stripping, and in which said stripping steam is at least partially derived from said hot, steam-containing feed gas, an improved method for maximizing heat recovery from said feed gas and thereby increasing the thermal efficiency of said regeneration stage comprising the steps of

(a) passing said feed gas in indirect heat exchange with said scrubbing solution, thereby heating said solution and producing steam;

(b) utilizing the steam produced in step (a) as stripping steam for regenerating said solution;

(c) utilizing the partially cooled feed gas from step (a) to heat water in a heat exchange system separate from that employed in step (a);

(d) reducing the pressure over the water heated in step (c), thus reducing the boiling temperature of said water and producing steam at a pressure lower than the pressure in said regeneration stage and bringing the cooled water resulting from said pressure reduction into heat-exchange relationship with said feed gas, thus further cooling said feed gas;

(e) compressing the low-pressure steam produced in step (d) to at least the pressure in said regeneration stage and utilizing such compressed steam as stripping steam for regenerating said solution;

(f) passing the cooled feed gas from step (d) to said absorption stage for removal of acid gases therefrom.

4,160,811

PRODUCTION OF TETRAFLUORAMMONIUM BIFLUORIDE AND TETRAFLUORAMMONIUM TETRAFLUOROBORATE

Joseph A. Neff, San Clemente, and William D. English, Orange, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 21, 1978, Ser. No. 879,634
Int. Cl.[2] C01B *35/06*; C01C *1/16*
U.S. Cl. 423—276 **16 Claims**

1. A process for the production of tetrafluorammonium bifluoride which comprises, in the absence of carbon dioxide and water:

(a) forming a solution of a fluoride of sodium selected from the group consisting of sodium fluoride, sodium bifluoride and mixtures thereof in anhydrous liquid hydrogen fluoride;

(b) forming a solution of a first metalloid compound of the formula NF_4MF_6 wherein M is a Group V metalloid in anhydrous liquid hydrogen fluoride;

(c) combining the solution of the fluoride of sodium in anhydrous liquid hydrogen fluoride and the solution of the first metalloid compound in anhydrous liquid hydrogen fluoride to form, by metathesis, a solution of tetrafluorammonium bifluoride in anhydrous liquid hydrogen fluoride and a second metalloid compound of the formula $NaMF_6$ wherein M is a Group V metalloid;

(d) separating, by crystallization, the second metalloid compound from the solution of tetrafluorammonium bifluoride in anhydrous liquid hydrogen fluoride at a temperature of from about −20° to about −50° C.

4,160,812

MULTI-STAGE CRYSTALLIZATION OF SODIUM CARBONATE

Edward H. Conroy, Green River, Wyo., and Arthur Gloster, New York, N.Y., assignors to Texasgulf Inc., Stamford, Conn.

Filed Sep. 20, 1977, Ser. No. 835,003
Int. Cl.[2] B01D *1/26*; C01D *7/00*
U.S. Cl. 423—421 **14 Claims**

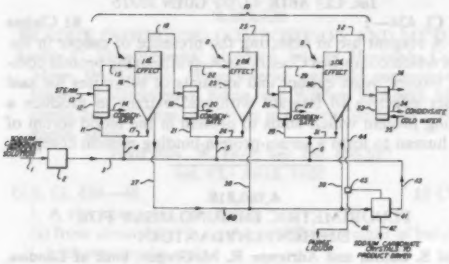
1. A process for preparing sodium carbonate crystals comprising:

feeding a substantially saturated sodium carbonate process solution to a multiple-effect evaporative crystallizer having at least three stages including a highest temperature first stage and a lowest temperature final stage, the process solution being directed in parallel to at least the first two

stages and with the majority of the process solution being fed to at least one stage ahead of the final stage;

drawing a slurry of sodium carbonate crystals in mother liquor from at least one stage of the crystallizer ahead of the final stage;

separating the sodium carbonate crystals in the drawn slurry from the mother liquor;



recycling the mother liquor to the crystallizer, the mother liquor being directed in parallel to at least the final two stages and with the majority of the recycled mother liquor being delivered to the final stage; and

withdrawing purge liquor only from the final stage of the crystallizer.

4,160,813

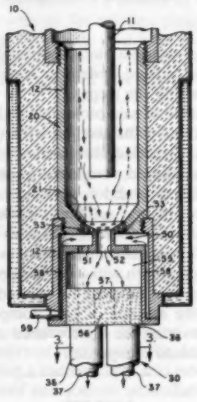
METHOD FOR HEAT TREATING CARBONACEOUS MATERIAL IN A FLUIDIZED BED

Richard F. Markel, Greenville, S.C., and W. M. Goldberger, Columbus, Ohio, assignors to Graphite Synthesis Company, Chicago, Ill.

Continuation of Ser. No. 592,118, Jul. 1, 1975, abandoned. This application Jul. 21, 1978, Ser. No. 926,901

Int. Cl.² C01B *31/02, 31/04*

U.S. Cl. 423—448 **9 Claims**



1. A thermal method for reducing, by means consisting essentially of the application of heat, the sulfur content of sulfur-containing carbonaceous material, said thermal method comprising the steps of:

continually introducing at a controlled rate sulfur-containing carbonaceous material, a substantial portion having a particle diameter size of greater than about 0.008 inches, independently of a fluidizing medium into a fluidizing zone;

continually discharging approximately equal amounts of sulfur-containing carbonaceous material from the fluidizing zone to maintain the sulfur-containing carbonaceous material in the fluidizing zone in dynamic equilibrium;

passing a fluidizing medium consisting essentially of an inert gas upwardly and from a bottom portion of the fluidizing zone through the sulfur-containing carbonaceous material in the fluidizing zone at a velocity sufficient to fluidize the sulfur-containing carbonaceous material and in a substantially uniform manner to remove sulfur-containing gas from the fluidizing zone and substantially to prevent reprecipitation of sulfur both within the fluidizing zone and onto the continually introduced sulfur-containing carbonaceous material;

heating the sulfur-containing carbonaceous material while in the uniform fluidized state within the fluidizing zone to a temperature in excess of about 1700° C.; and

controlling the temperature of the sulfur-containing carbonaceous material in the fluidizing zone to assure that the sulfur content of the sulfur-containing carbonaceous material in the fluidizing zone is reduced to below about 0.5%.

4,160,814

THERMAL DESULFURIZATION AND CALCINATION OF PETROLEUM COKE

Edward E. Hardin; Dean H. Guffey, and Lloyd I. Grindstaff, all of Elizabethton, Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Mar. 1, 1978, Ser. No. 882,336

Int. Cl.² C01B *31/02, 31/04;* C10B *57/02*

U.S. Cl. 423—461 **2 Claims**

1. A process for calcining and thermally desulfurizing raw petroleum coke without substantially lowering the bulk density of said coke, said coke having a high sulfur content and having been produced by the delayed coking process, which comprises:

(a) heating the coke at a first temperature in the range of about 490° to about 850° C. for a period of time in the range of about 30 to about 60 minutes such that no more than about 70 wt.% of the volatile matter content of said coke is removed therefrom; and

(b) heating the partially devolatilized coke at a second temperature of at least about 1500° C. for a period of time in the range of about 30 to about 70 minutes to substantially completely calcine said coke and remove a major portion of the sulfur content therefrom.

4,160,815

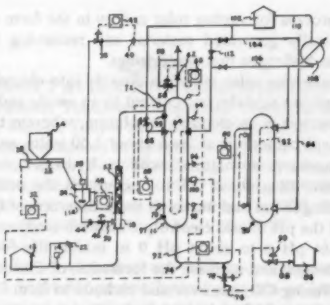
ALUMINUM SULFATE MANUFACTURING PROCESS

Durward A. Huckabay, Walnut Creek, Calif., assignor to Imperial West Chemical Company, Antioch, Calif.

Continuation of Ser. No. 609,248, Sep. 2, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,954

Int. Cl.² C01F *7/74*

U.S. Cl. 423—556 **4 Claims**



1. A process for the manufacture of aluminum sulfate by the

reaction of reactants consisting essentially of sulfuric acid and alumina which comprises:

(a) forming a slurry of alumina solids in water;

(b) continuously mixing said slurry and sulfuric acid in substantially stoichiometric proportions in a tubular mixing zone, preheating the reactants therein to reaction temperature, and diverting said reactants into helical flow and repeatedly reversing the direction of rotation of helical flow during passage of said reactants through said tubular mixing zone;

(c) continuously passing the reacting mixture of alumina solids and acid from said tubular zone into a retention zone partially filled with a liquid phase of said mixture and a vapor phase;

(d) retaining said reacting mixture in said retention zone for sufficient time to achieve from 78 to 100 percent complete reaction;

(e) maintaining the reacting mixture under said vapor phase in said retention zone maintained at autogenic pressure from 15 to about 150 psig, and at a temperature from 225° to about 260° F. by indirect heat exchange cooling of said reactants and said vapor phase with cooling water; and

(f) continuously withdrawing aluminum sulfate product from said liquid phase in said zone.

4,160,816

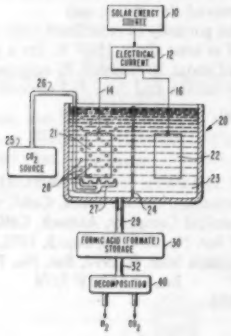
PROCESS FOR STORING SOLAR ENERGY IN THE FORM OF AN ELECTROCHEMICALLY GENERATED COMPOUND

Richard Williams, Princeton, and Allen Bloom, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,758

Int. Cl.[2] C01B *1/13*; C25B *3/04*

U.S. Cl. 423—648 R **6 Claims**



1. A process for storing solar energy in the form of an electrochemically generated material and retrieving the stored energy as hydrogen fuel comprising:

(a) converting solar radiation directly into electric current;

(b) applying said electric current to an anode and a cathode immersed in an electrolyte solution, wherein the voltage at said cathode is at least about 1.50 volts, said cathode comprising a material with a hydrogen overvoltage greater than about 0.5 volt to inhibit the production of hydrogen gas and increases the production of formic acid and the pH of said electrolyte solution is adjusted to from about pH 6 to about pH 9 to inhibit the formation of hydrogen and increase the formation of formic acid;

(c) diffusing CO_2 gas over said cathode to form formic acid;

(d) storing said formic acid; and

(e) retrieving said stored solar energy from said formic acid as H_2 fuel.

4,160,817

APPLICATION OF PROTEIN-PROTEIN INTERACTION AS AN ASSAY FOR THE DETECTION OF CANCER

Edsel T. Bucovaz; John C. Morrison, both of Memphis; William C. Morrison, Germantown, and Walter D. Whybrew, Memphis, all of Tenn., assignors to Research Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,633

Int. Cl.[2] A61K *43/00*; G01N *33/16*

U.S. Cl. 424—1 **61 Claims**

1. A reagent use in detecting the presence of cancer in humans which comprises Coenzyme A-synthesizing protein complex Bakers' yeast extract and amounts of substrates for said extract effective to interact with said extract to produce a binding protein which binds to protein in the blood serum of said human to form a serum-protein-binding protein complex.

4,160,818

FLUORIMETRIC IMMUNOASSAY FOR DIPHENYLHYDANTOIN

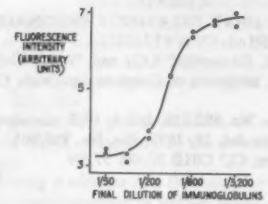
David S. Smith, and Adrienne R. McGregor, both of London, England, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Apr. 12, 1977, Ser. No. 787,232

Claims priority, application United Kingdom, Apr. 15, 1976, 15737/76; May 17, 1976, 20323/76

Int. Cl.[2] G01N *33/16, 21/52*

U.S. Cl. 424—8 **10 Claims**



1. A method of assaying a biological fluid sample for a hydantoin or a closely related hydantoin structured compound, said method comprising the steps of:

a. forming a mixture of said biological fluid sample containing said compound to-be-assayed with: (1) anti-compound antibodies, and (2) a fluorescent-labelled substituted compound, said substituted compound generally having little or no resemblance to said compound to-be-assayed prior to labelling but, having sufficient similarity to said compound to-be-assayed after labelling, so as to be bindable with said anti-compound antibodies, said anti-compound antibodies binding both with said compound to-be-assayed and said fluorescent-labelled substituted compound; and

b. determining the amount of said compound in the fluid sample by measuring the fluorescence of said fluorescent-labelled substituted compound.

4,160,819

METHOD OF INHIBITING SKIN IRRITATION

Sharon G. Willer, Loveland; Paul R. Yust, and Ralph Kelly, both of Cincinnati, all of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Division of Ser. No. 319,030, Dec. 27, 1972, Pat. No. 4,076,799. This application Jan. 20, 1978, Ser. No. 871,010

Int. Cl.[2] A61L *9/04*; A61K *31/74, 31/13, 31/135*

U.S. Cl. 424—45 **12 Claims**

1. A method for preventing or reducing irritation of the skin caused by contact with a skin irritating allergenic agent which comprises applying to the skin of a subject sensitized to said allergenic agent, prior to contact with said skin irritating aller-

genic agent, a protective agent containing at least two polar groups separated by a chain of at least 15 atoms, the majority of which are carbon atoms; wherein said protective agent is the condensation products of an alkylene oxide having 2 to 4 carbon atoms and a polyamine having 2 to 4 amino groups and containing 2 to 8 carbon atoms in an aliphatic, cycloaliphatic or aromatic group.

4,160,820

PLAQUE INHIBITING COMPOSITION AND METHOD

Austin C. Wagenknecht, deceased, late of Hennepin County, Minn. (by Don A. Wagenknecht, personal representative); George V. Daravingas, Edina, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Nov. 28, 1977, Ser. No. 855,527
Int. Cl.[2] A61K *9/68*
U.S. Cl. 424—48 **10 Claims**

1. A chewing gum containing:

(a) from about 0.005% to about 10% by weight of butylated hydroxyanisole; and,

(b) from about 0.001% to about 15% by weight of monocaprylin;

(c) from about 0.001% to about 5% by weight of a zinc compound; and,

(d) from about 0.05% to about 10% by weight of a plaque inhibiting flavor selected from the group consisting of cinnamon oil, peppermint oil, and spearmint oil and mixtures thereof; and,

(e) from about 10% by about 95% by weight of a gum base.

4,160,821

TREATMENT FOR GINGIVITIS

Tibor Sipos, Lebanon, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 27, 1978, Ser. No. 881,207
Int. Cl.[2] A61K *7/16, 7/24, 31/315, 33/30*
U.S. Cl. 424—49 **10 Claims**

1. A method for treating gingivitis which comprises topically applying to the gums of a patient in need of such treatment an effective amount for treating gingivitis of a composition which consists essentially of at least about 50% by weight of glycerol and from about 0.5 to 8% by weight of a pharmaceutically acceptable zinc salt that is soluble in said glycerol.

4,160,822

DENTIFRICES

Shigeru Hashimoto, Omihachiman, and Kenji Inoue, Takatsuki, both of Japan, assignors to Sunstar Hamigaki Kabushiki Kaisha, Takatsuki, Japan

Filed Sep. 28, 1977, Ser. No. 837,101
Claims priority, application Japan, Oct. 25, 1976, 51-129013; Mar. 29, 1977, 52-35998
Int. Cl.[2] A61K *7/18*
U.S. Cl. 424—52 **16 Claims**

1. A dentifrice comprising a foaming agent in admixture with other conventional ingredients for dentifrice, said foaming agent comprising a sucrose fatty acid ester, an N-acylamino acid or a salt thereof and sodium monofluorophosphate.

4,160,823

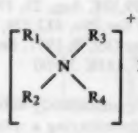
TRANSPARENT HAIR RINSING COMPOSITION

Hiroshi Watanabe; Toshihiro Shirose, both of Funabashi, and Eiji Iijima, Sakura, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,257
Claims priority, application Japan, Mar. 29, 1976, 51-34764
Int. Cl.[2] A61K *7/06, 7/09*; C11D *1/62*
U.S. Cl. 424—70 **7 Claims**

1. A transparent liquid hair rinsing composition consisting essentially of

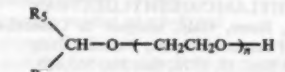
(A) from 0.1 to 10% by weight of one or a mixture of quaternary ammonium salts having the formula (I):



(I)

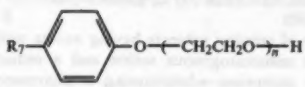
wherein R_1, R_2, R_3 and R_4 each is alkyl, hydroxyalkyl or benzyl, with the proviso that one or two of R_1, R_2, R_3 and R_4 is long-chain alkyl or hydroxyalkyl having 8 to 20 carbon atoms and the remaining groups are selected from alkyl and hydroxyalkyl having 1 to 3 carbon atoms and benzyl, and X is halogen or alkyl sulfate having 1 or 2 carbon atoms,

(B) from 0.1 to 10% by weight of non-ionic surface active agent having the formulas (II) or (III):



(II)

and



(III)

and mixtures thereof, wherein R_5 is an alkyl or alkenyl having 7 to 10 carbon atoms and R_6 is hydrogen or alkyl or alkenyl having 1 to 10 carbon atoms, with the proviso that the sum of the numbers of carbon atoms of the groups R_5 plus R_6 is in the range of from 7 to 19, R_7 is linear or branched alkyl having 6 to 12 carbon atoms, and n is the average value of the number of moles of added ethylene oxide units and is in the range of from 1 to 7, with the further proviso that the content of compound in which n is zero is lower than 3% based on the total weight of ingredient B,

(C) 5 to 30% by weight of a solvent selected from the group consisting of lower monohydric alcohols, polyhydric alcohols and glycols, and

(D) the balance is essentially water.

4,160,824

INSECT ATTRACTIVE COMPOSITIONS

Shinichi Inazuka, Yokohama; Shigekatsu Tsuchiya, Yokosuka; Katsumi Suzuki, Tokyo, and Toshiaki Miyanishi, Yokosuka, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 714,126, Aug. 13, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,815
Claims priority, application Japan, Aug. 16, 1975, 50/99077
Int. Cl.[2] A01N *17/14, 9/36, 23/00*
U.S. Cl. 424—84 **11 Claims**

1. In an insect attractive and killing composition which comprises a vegetable protein hydrolysate and an insecticide, the improvement wherein said protein hydrolysate is an acid-hydrolyzed defatted vegetable protein having a protein hydrolysis percent $\geqq 70\%$, which has been neutralized to a pH of 5–9.

4,160,825

ANTIBODY-ACTIVE PROTEIN COMPOSITION

Dennis Sikes, 316 Beechwood Dr., Athens, Ga. 30601

Continuation of Ser. No. 609,101, Aug. 29, 1975, abandoned, which is a continuation of Ser. No. 412,224, Nov. 2, 1973, abandoned. This application Oct. 5, 1977, Ser. No. 839,713

Int. Cl.[2] A61K *39/00*

U.S. Cl. 424—85 9 Claims

1. A method for producing an antibody-active protein composition which comprises administering a spleen cell preparation from a heterologous warm blooded species to a pregnant mare to hyperimmunize the mare, removing blood from the hyperimmunized mare, separating the clear serum from the blood, and fractionating said serum by a physical-chemical procedure to separate therefrom said antibody-active protein fraction.

4,160,826

INHIBITOR PREPARATION FOR THE ABSORPTION OF LIPIDS, BASED ON DIETHYLAMINOETHYLDEXTRAN

Ignazio Fischetti, Rome, Italy, assignor to Laboratory Biochimici Fargal-Pharmasint S.p.A., Pomezia, Italy

Filed Nov. 19, 1976, Ser. No. 743,425

Claims priority, application Italy, Dec. 12, 1975, 52661 A/75

Int. Cl.[2] A61K *31/73;* C08B *37/02*

U.S. Cl. 424—180 5 Claims

1. A process of treating subjects having excess weight for obtaining both antisteatogenous action and a reduction in weight which comprises administering a pharmacological preparation consisting essentially of diethylaminoethyl dextran as active agent and a pharmaceutical carrier wherein the diethylaminoethyl dextran is administered in doses of 1 to 2 grams twice a day for a total of 2 to 4 grams per day.

4,160,827

METRONIDAZOLE PHOSPHATE AND SALTS

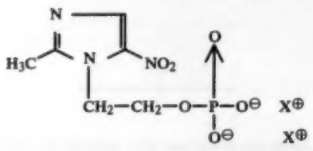
Moo J. Cho, and John J. Biermacher, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 6, 1978, Ser. No. 875,393

Int. Cl.[2] A61K *31/675, 31/685;* C07F *9/58, 9/65*

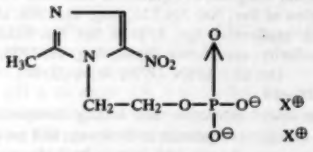
U.S. Cl. 424—199 7 Claims

1. A compound of the formula:



wherein $X^{\oplus}$ is a pharmacologically acceptable cation.

5. A process of antibiotic treatment comprising the administration to a subject of a therapeutic amount of a compound of the formula:



wherein $X^{\oplus}$ is a pharmacologically acceptable cation, in association with a pharmaceutical carrier.

4,160,828

ANALGESIC PHOSPHINYL COMPOUNDS AND COMPOSITIONS

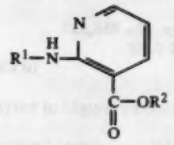
Alfons Söder, Frankfurt-Schwanheim, and Klaus Perrey, Bonn-Bad, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 702,604, Jul. 6, 1976, Pat. No. 4,091,095. This application Feb. 10, 1978, Ser. No. 876,984

Int. Cl.[2] A61K *31/675;* C07F *9/58, 9/60*

U.S. Cl. 424—200 8 Claims

1. A member selected from the group consisting of (a) a compound of the formula



wherein

R^1 is phenyl, substituted phenyl, quinolyl or substituted quinolyl, substituted phenyl and substitued quinolyl comprising at least one substituent selected from the group consisting of a halo, a trifluoromethyl and from 1 to 3 alkyl radicals having a total of up to 4 carbon atoms; and

R^2 is a member having from 3 to 7 carbon atoms and selected from the group consisting of dialkylphosphinylalkyl and dialkylphosphinylhydroxyalkyl;

and (b) an acid-addition salt of (a).

8. A pharmaceutical preparation having analgesic activity and containing an effective dose of a member as claimed in claim 1 in combination with at least one solid or fluid carrier or additive.

4,160,829

ANTIBACTERIAL 1,2,4-OXADIAZOLYLACETAMIDO CEPHALOSPORINS

Robert Heijboer, Waddinxveen; Antoon van Harrewijn, Delft, and Peter W. Henniger, Leiden, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

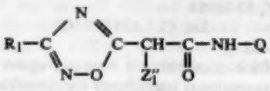
Continuation of Ser. No. 571,203, Apr. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 425,798, Dec. 18, 1973, abandoned. This application May 9, 1977, Ser. No. 795,024

Claims priority, application United Kingdom, Dec. 22, 1972, 59524/72

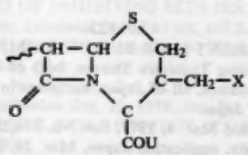
Int. Cl.[2] A61K *31/545;* C07D *501/56, 499/46, 271/06*

U.S. Cl. 424—246 6 Claims

1. A cephalosporanic acid derivative of the formula

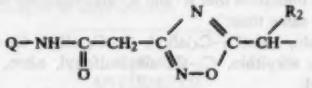


wherein Q is selected from the group consisting of



wherein U is a group OE', wherein E' is selected from the group consisting of hydrogen, a non-toxic, pharmaceutically acceptable salt forming cation and a non-toxic, pharmaceuti-

cally acceptable lower alkyl optionally substituted with lower alkanoyloxy, X is selected from the group consisting of acetoxy and S—Q', wherein Q' is selected from the group consisting of a tetrazolyl, triazolyl, imidazolyl or thiadiazolyl optionally substituted with alkyl of 1 to 6 carbon atoms, R_1 is carboxyl methyl optionally transformed into a non-toxic, pharmaceutically acceptable ester or salt and Z_1" is selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms and



wherein Q is as defined above and R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms.

3. A method of killing bacteria comprising contacting bacteria with a bactericidal amount of at least one compound of claim 1.

5. A method of combatting bacterial infections in warm-blooded animals comprising administering to warm-blooded animals a bactericidally effective amount of at least one compound of claim 1.

4,160,830

CEPHALOSPORINS

Shiro Morimoto, Kobe; Hiroaki Nomura, Takatsuki; Takeshi Fugono, Kawanishi, and Isao Minami, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

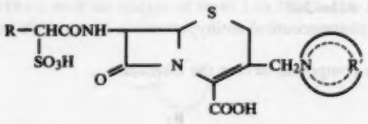
Division of Ser. No. 719,704, Sep. 2, 1976, Pat. No. 4,065,619, which is a continuation of Ser. No. 552,752, Feb. 25, 1975, abandoned, which is a continuation of Ser. No. 272,637, Jul. 17, 1972, abandoned. This application Oct. 14, 1977, Ser. No. 842,153

Claims priority, application Japan, Jul. 17, 1971, 46/53466; Oct. 22, 1971, 46/84130

Int. Cl.[2] A61K *31/54*

U.S. Cl. 424—246 **14 Claims**

1. A method for combatting bacterial infections which comprises administering by injection to a patient infected with the pathogenic bacteria an antibacterially effective amount of a compound of the formula:



wherein R is phenyl or thienyl, and R' is a group which constitutes together with the adjacent nitrogen atom a pyridinium group, said pyridinium group being unsubstituted or substituted by carbamoyl, or a 4'-methyl-5'-(β-hydroxyethyl)-thiazolium or a pharmaceutically acceptable salt thereof.

4,160,831

NOVEL INSECTICIDES

Verena Laanio, Arisdorf; Hans U. Brechbuhler, Basel, and Dagmar Berrer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

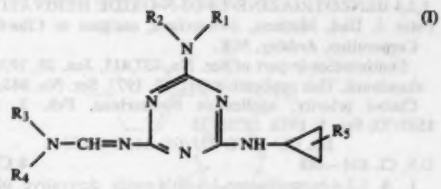
Continuation-in-part of Ser. No. 824,670, Aug. 15, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,988

Claims priority, application Switzerland, Aug. 19, 1976, 10560/76; Mar. 4, 1977, 2720/77

Int. Cl.[2] C07D *251/70, 295/02;* A61K *31/53, 31/535*

U.S. Cl. 424—248.56 **13 Claims**

1. A compound of the formula



(I)

wherein

R_1 represents hydrogen, C_1–C_4-alkyl which is unsubstituted or substituted by lower alkoxy; or represents C_3–C_4-alkenyl, C_3–C_4-alkynyl, cyclopropyl, hydroxyl, methoxy or ethoxy,

R_2 represents hydrogen, methyl or ethyl, or

R_1 and R_2 together with the nitrogen atom to which they are attached represent a 5- or 6-membered heterocyclic ring which can contain a further nitrogen atom or an oxygen atom,

R_3 represents methyl or ethyl,

R_4 represents methyl or ethyl, and

R_5 represents hydrogen or methyl.

9. A pesticidal composition which comprises an effective pesticidal amount of a compound of claim 1 together with a suitable carrier or additive or mixtures thereof.

4,160,832

NOVEL INSECTICIDES

Verena Laanio, Arisdorf; Hans U. Brechbühler, Basel, and Dagmar Berrer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

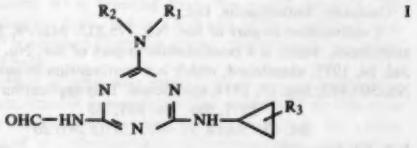
Continuation-in-part of Ser. No. 824,669, Aug. 15, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,989

Claims priority, application Switzerland, Aug. 19, 1976, 10559/76; Mar. 4, 1977, 2719/77

Int. Cl.[2] C07D *251/70, 295/02;* A61K *31/53, 31/535*

U.S. Cl. 424—248.56 **13 Claims**

1. A compound of the formula



I

wherein

R_1 represents hydrogen, C_1–C_4-alkyl which is unsubstituted or substituted by lower alkoxy, or represents C_3–C_4-alkenyl, C_3–C_4-alkynyl, cyclopropyl, hydroxy, methoxy or ethoxy,

R_2 represents hydrogen, methyl or ethyl, or

R_1 and R_2 together with the nitrogen atom to which they are attached represent a 5- or 6-membered heterocyclic ring which can contain a further nitrogen atom or an oxygen atom, and

R_3 represents hydrogen or methyl,

and the acid addition salts thereof.

9. A pesticidal composition which comprises an effective pesticidal amount of a compound of claim 1 together with a suitable carrier or additive or mixtures thereof.

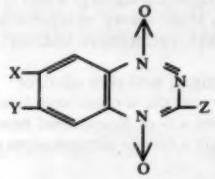
4,160,833

1,2,4-BENZOTRIAZINE-1,4-DI-N-OXIDE DERIVATIVES

Peter J. Diel, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 437,415, Jan. 28, 1974, abandoned. This application Oct. 19, 1977, Ser. No. 843,473
Claims priority, application Switzerland, Feb. 2, 1973, 1555/73; Sep. 5, 1973, 12733/73
Int. Cl.[2] C07D *253/08;* A61K *31/53*
U.S. Cl. 424—249 8 Claims

1. A 1,2,4-benzotriazine-1,4-di-N-oxide derivative of the formula I

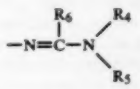


(I)

wherein

X and Y each independently represents hydrogen, alkyl or alkoxy having 1 to 4 carbon atoms, phenoxy, or halogen, and

Z stands for the group of the formula



wherein R_4 and R_5 each independently represents hydrogen or alkyl having 1 to 4 carbon atoms and R_6 represents hydrogen or methyl.

3. A composition for the control of pathogenic microorganisms, which composition contains as active substance an effective amount of a compound according to claim 1.

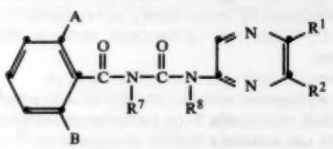
4,160,834

1-(SUBSTITUTED BENZOYL)-3-(SUBSTITUTED PYRAZINYL)UREAS

John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 775,813, Mar. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 595,904, Jul. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 507,492, Sep. 19, 1974, abandoned. This application Dec. 19, 1977, Ser. No. 861,733
Int. Cl.[2] A61K *31/495;* C07D *241/20*
U.S. Cl. 424—250 40 Claims

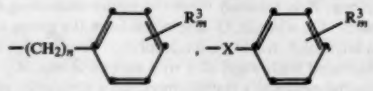
1. A compound of the formula



wherein

A and B are the same or different, and are halo, methyl, or trifluoromethyl;

R^1, when taken separately, is hydrogen, halo, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, halo(C_1–C_4)alkyl, nitro, cyano



or naphthyl;

R^2, when taken separately, is hydrogen, halo, methyl, ethyl, cyano, or halo(C_1–C_2)alkyl;

with the limitation that R^1 and R^2 may not both be hydrogen at the same time;

R^3 is halo, halo(C_1–C_4)alkyl, C_1–C_6 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, nitro, cyano, or phenyl;

m is 0, 1, 2, or 3;

n is 0 or 1;

X is -O-, -S-, or

and

R^7 and R^8, when taken separately, are the same or different, and are hydrogen, C_1–C_4 alkanoyl, or C_1–C_3 alkoxycarbonyl.

22. A method of controlling insects of an order selected from the group consisting of Coleoptera, Diptera, Lepidoptera, and Orthoptera, which comprises applying to the locus of the insects an insecticidal amount of a compound of claim 1.

4,160,835

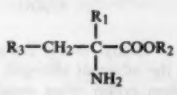
ANTIHYPERTENSIVE COMPOSITIONS CONTAINING AN ARYLSUBSTITUTED ALANINE AND A PHENYL HYDRAZINOPROPIONIC ACID

Clement A. Stone, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 743,369, Nov. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 657,822, Feb. 13, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,755
Int. Cl.[2] A61K *31/44, 31/445*
U.S. Cl. 424—263 12 Claims

1. A pharmaceutical antihypertensive composition comprising

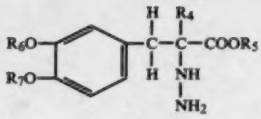
(A) a compound having the formula:



and pharmaceutically acceptable salts thereof, wherein R_1 and R_2 may be hydrogen or alkyl of from 1 to 4 carbon atoms, and R_3 is a substituted or unsubstituted heterocyclic ring having the formula:

in which the heterocyclic ring is selected from the group consisting of 2-hydroxypyrid-4-yl, 2-aminopyrid-4-yl, 2-carboxypyrid-4-yl and tetrazol-[1,5-a]pyrid-6-yl, and pharmaceutically acceptable salts thereof, and tetrazol-[1,5-alpyrid-6-yl, and pharmaceutically acceptable salts thereof, and

(B) a decarboxylase inhibitor having the formula:



wherein R_4, R_5, R_6 and R_7 are independently selected from the group consisting of hydrogen and C_1–C_4 alkyl, and pharmaceutically acceptable salts thereof.

4,160,836
ANTIEMETIC
1-(BENZOTHIAZOLYLALKYL)PIPERIDINE DERIVATIVES

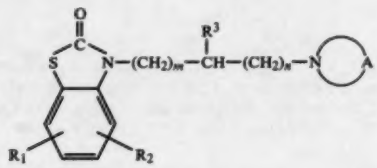
Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van Der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 687,139, May 17, 1976, Pat. No. 4,066,772, which is a continuation-in-part of Ser. No. 597,793, Jul. 21, 1975, abandoned. This application Jul. 20, 1977, Ser. No. 817,395

Int. Cl.[2] **A61K** *31/445;* **C07D** *417/06, 417/14*

U.S. Cl. 424—267 **10 Claims**

1. A chemical compound selected from the group consisting of a 1-(benzolhiazolylalkyl)piperidine derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

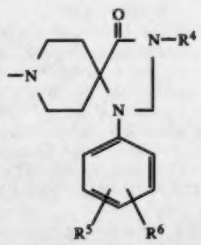
R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

R^3 is a member selected from the group consisting of hydrogen and methyl;

m and n are each an integer of from 1 to 2 inclusive; and the radical

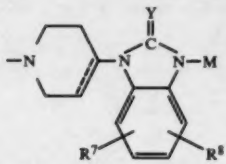
is a member selected from the group consisting of:

(a) a radical having the formula:



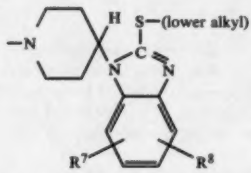
wherein R^4 is a member selected from the group consisting of hydrogen and lower alkyl; and R^5 and R^6 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

(b) a radical having the formula:



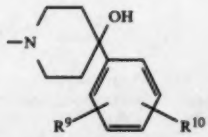
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and then said M is hydrogen;

(c) a radical having the formula:



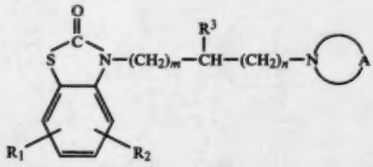
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

(d) a radical having the formula:



wherein R^9 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and R^{10} is selected from the group consisting of hydrogen and halo.

9. A method of inhibiting emesis which comprises the systemic administration in warm-blooded animals of an effective antiemetic amount of a compound selected from the group consisting of a 1-(benzathiazolylalkyl)piperidine derivative having the formula:

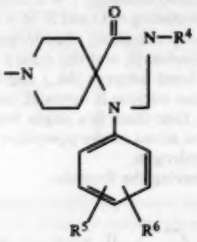


and the pharmaceutically acceptable acid addition salts thereof, wherein:

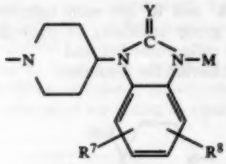
R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

R^3 is a member selected from the group consisting of hydrogen and methyl;
m and n are each an integer of from 1 to 2 inclusive; and
the radical

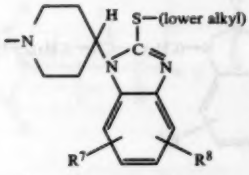
is a member selected from the group consisting of:
(a) a radical having the formula:



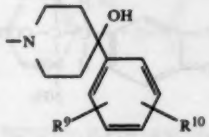
wherein R^4 is a member selected from the group consisting of hydrogen and lower alkyl; and R^5 and R^6 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;
(b) a radical having the formula:



wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; Y is a member selected from the group consisting of O and S; M is a member selected from the group consisting of hydrogen, lower alkyl and lower alkylcarbonyl; and the dotted line indicates that the double bond between the 3 and 4 carbon atoms of the piperidine nucleus is optional, provided that when said Y is S, then there is a single bond between said 3 and 4 carbon atoms of the piperidine nucleus, and then said M is hydrogen;
(c) a radical having the formula:



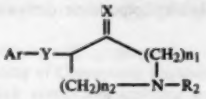
wherein R^7 and R^8 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and
(d) a radical having the formula:



wherein R^9 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl, and R^{10} is selected from the group consisting of hydrogen and halo;
in admixture with a pharmaceutical carrier.

4,160,837
DERIVATIVES OF PERHYDRO-AZA-HETEROCYCLES
Romeo Paioni, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Aug. 24, 1977, Ser. No. 827,274
Claims priority, application Luxembourg, Sep. 1, 1976, 75701
Int. Cl.[2] C07D *211/46;* A61K *31/445*
U.S. Cl. 424—267 **15 Claims**

1. A compound of the formula



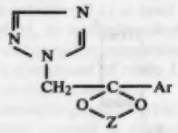
(I)

wherein X is hydrogen and OR_1 in which R_1 is hydrogen, lower alkyl having up to 4 carbon atoms or an acyl group —C(=D)R, in which R is lower alkyl having up to 4 carbon atoms, R_2 is hydrogen, lower alkyl having up to 4 carbon atoms or propargyl, Ar is phenyl, naphthyl or 5,6,7,8-tetrahydronaphthyl, which are unsubstituted or mono- or disubstituted in an aromatic ring, at most two substituents being selected from lower alkyl and lower alkoxy, both having at most 4 carbon atoms, or halogen, and at most one substituent being selected from trifluoromethyl, carbamoyl, nitro and cyano, Y is oxygen, n_1 is one and n_2 is two or n is two and n is one, and the acid addition salts thereof.

15. A method for the treatment of mental depression in a warm-blooded animal comprising enteral or parenteral administration to said animal of a therapeutically effective amount of a compound according to claim **1** having the formula I defined in claim **1**, or of a pharmaceutically acceptable acid addition salt thereof.

4,160,838
ANTIMICROBIAL AND PLANT-GROWTH-REGULATING TRIAZOLE DERIVATIVES
Gustaaf Van Reet, Tessenderlo; Jan Heeres, Vosselaar, and Lourens Wals, Turnhout, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium
Continuation-in-part of Ser. No. 802,702, Jun. 2, 1977, abandoned, which is a division of Ser. No. 620,989, Oct. 9, 1975, Pat. No. 4,079,062, which is a continuation-in-part of Ser. No. 524,587, Nov. 18, 1974, abandoned. This application Jan. 3, 1978, Ser. No. 866,317
Int. Cl.[2] A01N *9/22;* C07D *405/06*
U.S. Cl. 424—269 **7 Claims**

1. A composition for combatting a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective amount of a chemical compound selected from the group consisting of a 1-(β-aryl)ethyl-1H-1,2,4-triazole ketal of the formula:



and the therapeutically active acid addition salts thereof, wherein:

Z is an alkylene selected from the group consisting of —CH_2—CH_2—, —CH_2—CH_2—CH_2—, —$CH(CH_3)$—$CH(CH_3)$—and —CH_2—CH(alkyl)—,

wherein said alkyl has from 1 to 10 carbon atoms; and

Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, 5-chloro-2-thienyl, naphthyl, fluorenyl, and wherein "substituted phenyl" has the meaning of a phenyl radical having thereon from 1 to 3 substituents selected independently from the group consisting of halo, lower alkyl, lower alkyloxy, cyano and nitro.

4,160,839

CARBAMYLTRIAZOLE INSECTICIDES

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1976, Ser. No. 662,496
Int. Cl.[2] A01N *9/12*; C07D *249/12*
U.S. Cl. 424—269 **10 Claims**

1. The method of killing aphids in the presence of living plants comprising applying to the locus of the aphids an aphicidally effective but substantially non-phytotoxic amount of 1-(N,N-dimethylcarbamyl)-3-cyclopropyl-5-(2-propynylthio)-1H-1,2,4-triazole.

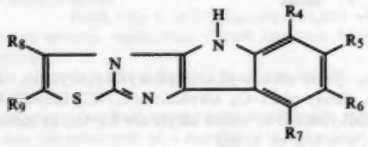
4,160,840

DERIVATIVES OF IMIDAZOINDOLE AND IMIDAZOTHIAZOLE

Parimal K. Adhikary, 510 Basswood Dr., Apt. No. 6, Nashville, Tenn. 37209

Continuation of Ser. No. 726,390, Sep. 24, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,854
Int. Cl.[2] C07D *277/60*
U.S. Cl. 424—270 **9 Claims**

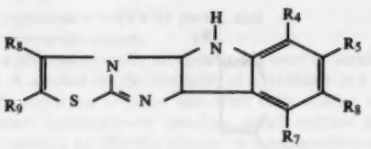
1. Compounds having the formula



Ia

and pharmaceutically acceptable acid addition salts thereof wherein R_4, R_5, R_6, and R_7 are selected from the group consisting of hydrogen, halogen and lower-alkyl of from one to four carbon atoms, inclusive, with the proviso that when taken together they constitute the following substituents on the tetracyclic ring, 9-halo, 8-halo, 7-halo, 6-halo, 9-lower-alkyl, 8-lower-alkyl, 7-lower-alkyl, 6-lower-alkyl, 7,9-dihalo, 7,8-dihalo, 6,8-dihalo, 6,7-dihalo, 7,9-di-lower-alkyl, 7,8-di-lower-alkyl, and 4,6-di-lower-alkyl, R_8 is selected from the group consisting of hydrogen, lower-alkyl of from one to four carbon atoms, inclusive, and R_9 is selected from the group consisting of hydrogen and halo.

7. A method of treating hypertension in mammals which comprises administering by injection to mammals a hypertension lowering amount of a compound having the formula



Ia

and pharmaceutically acceptable acid addition salts thereof wherein R_4, R_5, R_6, and R_7 are selected from the group consisting of hydrogen, halogen and lower-alkyl of from one to four carbon atoms, inclusive; with the proviso that when taken together they constitute the following substituents on the tetracyclic ring, 9-halo, 8-halo, 7-halo, 6-halo, 9-lower-alkyl, 8-lower-alkyl, 7-lower-alkyl, 6-lower-alkyl, 7,9-dihalo, 7,8-dihalo, 6,8-dihalo, 6,7-dihalo, 7,9-lower-alkyl, 7,8-di-lower-alkyl, and 4,6-di-lower-alkyl, R_8 is selected from the group consisting of hydrogen, lower-alkyl of from one to four carbon atoms, inclusive, and R_9 is selected from the group consisting of hydrogen and halo.

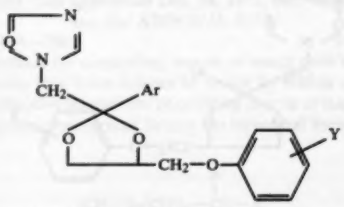
4,160,841

HETEROCYCLIC DERIVATIVES OF 1-(1,3-DIOXOLAN-2-YLMETHYL)-1H-IMIDAZOLES

Jan Heeres, Vosselaar; Leo J. J. Backx, Arendonk, and Joseph H. Mostmans, Antwerp, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 764,265, Jan. 31, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,726
Int. Cl.[2] A61K *31/415*; C07D *405/14*
U.S. Cl. 424—273 R **5 Claims**

1. A chemical compound selected from the group consisting of an azole derivative having the formula:



and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is CH;

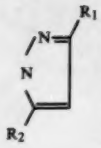
Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a member selected from the group consisting of:

a 1H-pyrrol-1-yl radical of the formula

(a);

a 1H-pyrazol-1-yl radical of the formula

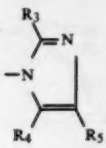


(b)

wherein

R_1 is selected from the group consisting of hydrogen, lower alkyl, lower alkylthio and phenyl, and, R_2 is selected from the group consisting of hydrogen, lower alkyl and phenyl; and

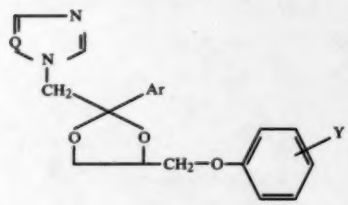
a 1H-imidazol-1-yl radical of the formula



(c)

wherein R_3 is selected from the group consisting of hydrogen, lower alkyl, phenyl, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, R_4 is selected from the group consisting of hydrogen, lower alkyl and phenyl, and, R_5 is selected from the group consisting of hydrogen and phenyl.

5. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective amount of a compound selected from the group consisting of an azole derivative having the formula:



and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is CH;

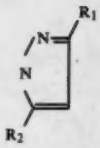
Ar is a member selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy; and

the radical Y is a member selected from the group consisting of:

a 1H-pyrrol-1-yl radical of the formula

(a);

a 1H-pyrazol-1-yl radical of the formula

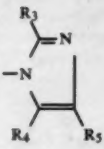


(b)

wherein

R_1 is selected from the group consisting of hydrogen, lower alkyl, lower alkylthio and phenyl, and, R_2 is selected from the group consisting of hydrogen, lower alkyl and phenyl; and

a 1H-imidazol-1-yl radical of the formula



(c)

wherein

R_3 is selected from the group consisting of hydrogen, lower alkyl, phenyl, lower alkylthio, lower alkylsulfinyl and lower alkylsulfonyl, R_4 is selected from the group consisting of hydrogen, lower alkyl and phenyl, and, R_5 is selected from the group consisting of hydrogen and phenyl.

4,160,842

INSECTICIDAL [β-(SUBSTITUTED-PHENYL)VINYL]CYCLOPROPANECARBOXYLATES

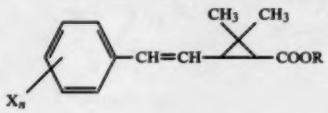
John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 27, 1976, Ser. No. 718,253

Int. Cl.[2] **C07C** *69/76, 121/64;* **A01N** *9/24*

U.S. Cl. 424—274 **10 Claims**

1. An insecticidal compound of the formula:

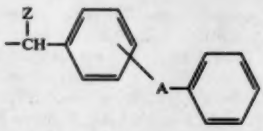


in which

X is halogen, cyano, nitro, aryl, aralkyl, aryloxy, arylthio, alkyl of C_1–C_4, alkoxy of C_1–C_4, alkylthio of C_1–C_4, haloalkyl of C_1–C_2, dialkylamino in which alkyls are C_1–C_2, or methylenedioxy; n is 1, 2, or 3; and

R is an alcohol residue selected from the group consisting of:

(a) a benzyl- or phenoxy-substituted benzyl group of the formula:



wherein Z is hydrogen, methyl, cyano, ethynyl, or phenyl, and A is —O— or —CH_2—;

(b) a benzyl- or phenoxy-substituted furylmethyl group;

(c) an imidomethyl group selected from the group consisting

of maleimidomethyl, phthalimidomethyl, and tetrahydrophthalimidomethyl; and,

(d) a benzyl group substituted in at least two ring positions with chloro, methyl, or methylenedioxy groups.

8. An insecticidal composition comprising an insecticidally effective amount of a compound of claim 1 in admixture with an agriculturally acceptable extender.

10. A method of controlling insects which comprises applying to the locus where control is desired an insecticidally effective amount of a compound of claim 1.

4,160,843

NOVEL AMIDINES

Henry Szczepanski, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

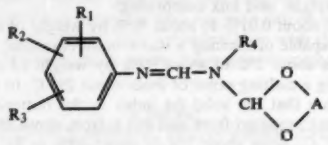
Filed Dec. 12, 1977, Ser. No. 859,347

Claims priority, application Switzerland, Dec. 16, 1976, 15824/76; Aug. 9, 1977, 9738/77; Nov. 9, 1977, 13662/77

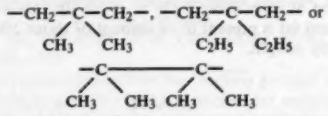
Int. Cl.[2] C07D *317/32, 319/06*

U.S. Cl. 424—278 **9 Claims**

1. A phenylformamidine of the formula



wherein each of R_1, R_2 and R_3 represents hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, halogen or trifluoromethyl, R_4 represents C_1–C_4alkyl and A represents $—CH_2—CH_2—$, $—CH_2—CH_2—CH_2—$,



4,160,844

COMPOSITION FOR TREATING SKIN MAST CELLS AND/OR DELAYED CELLULAR HYPERSENSITIVITY REACTIONS

Thomas S. C. Orr, Melton Mowbray, and Raymond W. Keogh, East Goscote, both of England, assignors to Fisons Limited, London, England

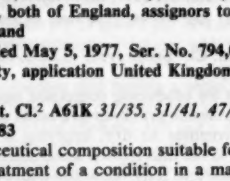
Filed May 5, 1977, Ser. No. 794,030

Claims priority, application United Kingdom, May 21, 1976, 20986/76

Int. Cl.[2] A61K *31/35, 31/41, 47/00*

U.S. Cl. 424—283 **13 Claims**

1. A pharmaceutical composition suitable for application to the skin for treatment of a condition in a mammal involving skin mast cells and/or delayed cellular hypersensitivity reaction, said composition comprising a pharmaceutical carrier acceptable on the skin of said mammal and, as active ingredient, an effective amount of a compound having the formula



in which

R_1 represents hydroxy,

an adjacent pair of R_2, R_3 and R_4 form a $—(CH_2)_4—$ chain,

and the remaining substituent R_2 or R_4 represents alkyl C 1 to 9,

E represents a —COOH group, and

X represents oxygen,

or a pharmaceutically acceptable salt, ester or amide thereof.

12. A method for the treatment of a condition in a mammal, which condition involves skin mast cells and/or a delayed (cellular) hyersensitivity reaction, which method comprises administering an effective amount of a composition of claim 1 to a mammal having such a condition.

4,160,845

FUNGICIDAL N-(HALOALIPHATICTHIO)HALOVINYLSULFONAMIDES

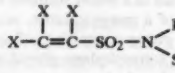
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 2, 1976, Ser. No. 646,134

Int. Cl.[2] A01A *9/00;* **C07C** *143/822*

U.S. Cl. 424—298 **9 Claims**

1. A compound of the formula



wherein X groups are chloro and bromo, R^1 is alkyl of 1 to 3 carbon atoms, and R^2 is polyhaloalkyl of 1 to 2 carbon atoms and 2 to 5 of the same or different halogen selected from chloro or bromo.

4,160,846

METHOD FOR CONTROLLING INSECTS WITH TETRASUBSTITUTED ORGANOTIN COMPOUNDS

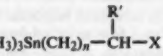
Richard J. Strunk, Cheshire; Winchester L. Hubbard, Woodbridge, and Robert E. Grahame, Jr., Cheshire, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 536,678, Dec. 26, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,983

Int. Cl.[2] A01N *9/12, 9/14*

U.S. Cl. 424—288 **14 Claims**

1. A method for controlling insects or insect pests comprising applying to a locus subject to attack by insects or insect pests an effective amount for controlling insects or insect pests of an organotin compound having the structural formula



wherein:

R′ is hydrogen, hydroxyl, alkoxyl or a straight chain or branched alkyl group having 1 to 5 carbon atoms;

X is (a) $—SO_2R_1$, R′ being hydrogen, and wherein R_1 is piperidinoethylmethiodide;

(b) $—OR_7$, wherein R_7 is epoxyalkylene having 2 to 4 carbon atoms, and tetrahydro-1,1-dioxo-3-thienyl;

(c) $—SR_{10}$, R′ being hydrogen, and wherein R_{10} is piperidinoethylmethiodide;

(d) 2-pyridyl;

(e) 4-pyridyl;

(f) 2-alkyl-5-pyridyl;

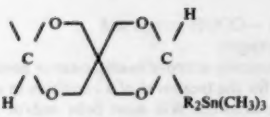
(g) 9-carbazolyl;

(h) 1-imidazolyl;

(i) N-2-oxopyrrolidinyl;

(j) $-OCOR_{17}$, wherein R_{17} is $—NHR_{18}$, wherein R_{18} is 2-furyl;

(k) tetrahydro-1,1-dioxo-2-thenyl;



(I)

wherein

R_2 is polymethylene having 2 to 11 carbon atoms; and

n is an integer from 1 to 10.

4,160,847

PROCESS OF IMPROVING THE FREEZE-THAW STABILITY OF FISH BAIT

George O. Orth, Jr., 10612 Riviera Pl. NE., Seattle, Wash. 98125

Filed Mar. 10, 1977, Ser. No. 776,139

Int. Cl.[2] A23B *4/00*

U.S. Cl. 426—1 **3 Claims**

1. A process for the preparation of a fish bait and improving the freeze-thaw stability of fish bait without substantial dehydration thereof consisting essentially of:

immersing the fish bait in a water solution containing 20% to 60% by volume of a water soluble, non-toxic glycol selected from the group consisting of triethylene glycol, diethylene glycol, tetraethylene glycol, propylene glycol, dipropylene glycol and glycerine,

applying a vacuum up to 28 inches mercury to the water solution containing the fish bait for a period of time ranging from 3 to 30 minutes,

then applying pressure to the water solution containing the fish bait of from 40 to 100 psi for a period of time ranging from 1 to 10 minutes, and

removing the fish from the water solution for packing and freezing.

4,160,848

ANTISTALING AGENT FOR BAKERY PRODUCTS

Frederick D. Vidal, Englewood Cliffs, and Albert B. Gerrity, Holmdel, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 18, 1977, Ser. No. 788,193

Int. Cl.[2] A21D *2/16*

U.S. Cl. 426—24 **12 Claims**

1. A compositions of matter consisting essentially of (1) a glycerol ester of a C_{10}–C_{24} saturated aliphatic fatty acid wherein at least 10 weight percent of said ester is a monoester, and (2) for each part by weight of said ester, from about 0.25 to about 1.0 part of a component selected from the group consisting of a free C_{14}–C_{20} saturated aliphatic fatty acid, sodium and magnesium salts of said free acid, pentaerythritol monoester of said free acid and mixtures of said components.

4,160,849

FOODS CONTAINING POTATO PULP

Michel Huchette, and Guy Bussiere, both of Lestrem, France, assignors to Roquette Freres, Lestrem, France

Filed Nov. 15, 1976, Ser. No. 742,001

Claims priority, application France, Nov. 17, 1975, 75 35016

Int. Cl.[2] A23L *1/195*

U.S. Cl. 426—94 **25 Claims**

1. A food selected from the group consisting of a fruit compote, a marmalade, a tomato-based sauce, a fruit juice, a fruit based drink, a confectionery comprising fruit and a pastry comprising fruit or coconut, said food containing an amount of neutral flavored dried potato pulp,

wherein said dried potato pulp is in powder form and comprises less than 70 weight percent starch, 5 to 25 weight percent humidity, 1 to 7 weight percent proteins (N × 6.25), 0.5 to 5 weight percent minerals, 0.1 to 1.5 weight percent oily materials, 5 to 25 weight percent cellulosic material and 10 to 55 weight percent, by difference, of other structural polysaccharides, wherein the amount of said neutral flavored dried potato pulp is effective to render said food pulpy in texture.

4,160,850

SHELF-STABLE MIX FOR A SPREADABLE BUTTER-SUBSTITUTE

Curtis H. Hallstrom, Anoka; Ali R. Touba, Mound; Brian E. Glass, Plymouth; John V. Luck, and George V. Daravingas, both of Edina, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 605,478, Aug. 25, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,566

Int. Cl.[2] A23D *3/00, 5/00*

U.S. Cl. 426—601 **20 Claims**

1. A packaged shelf-stable mix suitable for the consumer preparation of a spreadable butter-substitute product upon the addition of water or water and an oil, such butter-substitute product having an oil content of from about 20% to about 80% by weight and a water content of from about 10% to about 80% by weight, said mix comprising:

(a) from about 0.01% to about 80% by weight of an emulsifier capable of forming a water-in-oil emulsion;

(b) from about 2% to about 99% by weight of a hard fat having a melting point of from about 29° C. to about 66° C. such that the solid fat index in the butter-substitute product prepared from said mix is from about 2% to 35% at 10° C., from about 1% to about 20% at 21° C., from about 0.9% to 15% at 27° C., from about 0% to 8% at 33° C. and from about 0% to 5% at 37.8° C.; and

(c) from 0% to about 97% by weight of an oil with the proviso that when the oil is present in an amount of about 5% to about 97% by weight, the emulsifier is present in an amount of from about 0.1% to about 30% by weight and the hard fat is present in an amount of about 2% to about 80% by weight.

4,160,851

PROCESS FOR THE PRODUCTION OF PLASTICS/METAL COMPOSITES

Hans-Jurgen Lienert, Cologne; Helmut Kleimann, Leverkusen; Dieter Dieterich, Leverkusen; Wulf von Bonin, Leverkusen; Klaus Friederich, Leverkusen, all of Fed. Rep. of Germany, and Peter Markusch, New Martinsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,880

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633764

Int. Cl.[2] B05D *1/38, 7/14, 3/02*

U.S. Cl. 427—379 **14 Claims**

1. In a process for producing composite materials comprising applying an adhesion promoter to a metal surface, allowing said adhesion promoter to dry, applying a polyisocyanate reaction mixture to the thus treated metal surface and allowing said reaction mixture to fully react, the improvement wherein said adhesion promoter comprises an aqueous polyurethane dispersion.

4,160,852

PRODUCTION OF STERILE PACKAGES

Roland M. Torterotot, "Le Petit Chaillot", 78730 Rochefort-en-[illegible]elines, and Jean R. L. Nasica, 19, avenue Emile Deschanel, [illegible]Paris, both of France

Filed Sep. 29, 1977, Ser. No. 837,750

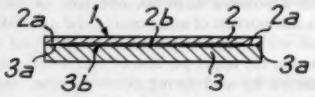
Claims priority, application France, Oct. 6, 1976, 76 30144; Jun. 1, 1977, 77 16772

Int. Cl.[2] B32B *3/02*

U.S. Cl. 428—192 **18 Claims**

1. A composite packaging laminate which is internally sterile and which is intended for the sterile packing of products, preferably in liquid and/or paste form, but which is without

such products therein, said composite packaging laminate comprising at least two individual strips, one of which comprises a thermoplastic material, said strips being adhered together in a sealing manner at least at their edges whereby the adjacent surfaces of the strips lie in opposed, facing relationship, said adjacent surfaces being sterile and having been sterilised by the time they are adhered together, said adjacent



surfaces also being readily separable each from the other under the action of pulling forces applied to the individual strips in divergent directions at a temperature which is at most equal to the softening temperature of the thermoplastic material, the thermoplastic material being such that after the separation of the two individual strips, the said one strip can be heat sealed to part of itself or to another individual strip with the application of heat and pressure to the thermoplastic material.

4,160,853

CATALYST FOR MAKING POLYCARBONATE DIOLS FOR USE IN POLYCARBONATE URETHANES

Vernon G. Ammons, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 681,012, Apr. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 385,019, Aug. 2, 1973, abandoned. This application Nov. 29, 1977, Ser. No. 855,585

Int. Cl.² B32B *27/40*; C08G *18/42, 63/62*

U.S. Cl. 428—425 **22 Claims**

1. A polyurethane which is the reaction product of:

a. a polycarbonate diol having a molecular weight between 500 and 5000 prepared by the reaction of a hydroxy-terminated aliphatic diol with a dialkyl carbonate in the presence of a titanium catalyst, said catalyst being a titanium compound which is substantially free from alkali metal; and

b. an organic diisocyanate.

15. A safety glass laminate comprising:

a. a ply of glass; and

b. laminated to said ply of glass a ply of transparent, energy-absorbing polycarbonate urethane which is the reaction product of

(1) a polycarbonate diol having a molecular weight between 500 and 5000 prepared by the reaction of a hydroxy-terminated aliphatic diol and a dialkyl carbonate in the presence of a titanium catalyst said catalyst being a titanium compound which is substantially free from alkali metal; and

(2) an organic diisocyanate.

18. A safety glass laminate comprising:

a. a ply of glass; and

b. laminated to said ply of glass, a ply of transparent, energy-absorbing polycarbonate urethane which is the reaction product of:

(1) a polycarbonate diol having a molecular weight between 500 and 5000 prepared by the reaction of a hydroxy-terminated aliphatic diol and a dialkyl carbonate in the presence of a titanium catalyst, said catalyst being a titanium compound which is substantially free from alkali metal;

(2) an organic diisocyanate; and

(3) an organic compound which contains at least two isocyanate-reactive hydrogens and has a molecular weight less than about 250.

4,160,854

DUCTILE BRAZING FOIL FOR CAST SUPERALLOYS

Thomas L. D'Silva, Belmont, Calif., assignor to Western Gold & Platinum Co., Belmont, Calif.

Filed Jul. 19, 1978, Ser. No. 925,907

Int. Cl.² F16B *5/08*

U.S. Cl. 428—607 **3 Claims**

1. A brazing foil consisting essentially of a substrate having the formula $P_xQ_yR_z$ wherein P is an element selected from the group consisting of iron, nickel, chromium, cobalt and mixtures thereof, Q is a refractory element selected from the group consisting of molybdenum, tungsten, tantalum and mixtures thereof, R is a reactive element selected from the group consisting of aluminum, titanium, columbium and mixtures thereof, x is from about 65 to about 95 atomic percent, y is from about 1 to about 10 atomic percent, z is from about 1 to about 18 atomic percent, said substrate containing an effective amount of an amorphous phase and a micro-crystalline, metastable single phase to render said substrate ductile and on the external surfaces a coating of nickel, iron or cobalt boride as a melting point depressant, said foil having a thickness of from about 0.0005 to about 0.005 inches.

4,160,855

ELECTRICAL CONTACT ELEMENT AND METHOD OF PRODUCING THE SAME

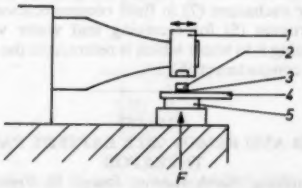
Dieter Stöckel, Birkenfeld, and Hans-Jürgen Oberg, Kelterndietlingen, both of Fed. Rep. of Germany, assignors to G. Rau, Pforzheim, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 826,194

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 2642323

Int. Cl.² B23K *21/02*

U.S. Cl. 428—621 **3 Claims**



1. In an electrical element of the type including at least one contact piece joined to a carrier by means of ultrasonic welding, and an intermediate layer of readily cold-weldable metallic material which is inserted between each contact piece and the carrier prior to ultrasonic welding, the improvement wherein said intermediate layer consists of a metal powder shaped by the ultrasonic welding operation into said intermediate layer simultaneously with the joining of said carrier and each contact piece by the ultrasonic welding operation, and wherein the thickness of the metal powder prior to the ultrasonic welding operation is less than 100 μm.

4,160,856

NOVEL FUEL CELL CONTAINING NOVEL MEANS FOR REMOVAL OF CARBONATES

Bernard Warszawski, Paris, France, assignor to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie, Paris, France

Division of Ser. No. 541,996, Jan. 17, 1975, Pat. No. 4,002,493. This application Dec. 16, 1976, Ser. No. 751,213

Claims priority, application France, Jan. 25, 1974, 74 02516

Int. Cl.² H01M *8/06*

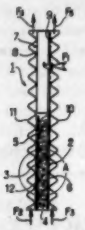
U.S. Cl. 429—14 **26 Claims**

1. Fuel cell having a plurality of elements (1) arranged in electrical contact with one another, each element comprising

a compartment (5) containing a pervious catalytic cathode electrode (2) and a pervious catalytic anode electrode (3) in spaced relationship to each other on opposed sides of said compartment (5) forming a space therebetween, said anode electrode (3) being a composite anode comprising (i) a catalyst component, and (ii) a fixing agent component for fixing carbonate ions,;

means for charging an aqueous alkaline electrolyte (6) to fill the space between the electrodes in said compartment (5) and means for discharging said electrolyte from said space during the decarbonation phase;

a porous separating membrane (12) saturated with said electrolyte located in the space filled by the electrolyte and



alternately contacting each of said cathode and said anode in a plurality of positions;

wherein during operation of said fuel cell a combustive gas contacts the cathode electrode (2) and a gaseous fuel contacts the anode electrode (3), thereby forming water vapor, and generating carbonate ions at the anode electrode which are fixed by said fixing agent; and

means for converting said carbonate ions to carbon dioxide and means for removing said carbon dioxide when said electrolyte is discharged; and

condenser exchanger (7) in fluid communication with said compartment (5) for receiving said water vapor, then condensing it to water which is returned to the electrolyte in said compartment (5).

4,160,857

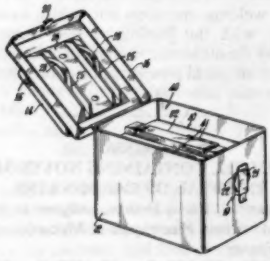
CANISTER AND REMOVABLE BATTERY PACK UNIT THEREFOR

Paul C. Nardella, North Easton; Joseph D. Feeney, Carver; Thomas A. Wrublewski, Braintree, and Anthony W. Gonsalves, Randolph, all of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Feb. 16, 1978, Ser. No. 878,493

Int. Cl.[2] H01M *2/10*

U.S. Cl. 429—97 **5 Claims**



1. In combination, a canister and a removable battery pack unit, said canister comprising a receptacle into which said battery pack unit is positioned; a cover enclosing said battery pack unit in said receptacle; a pair of electrical spring contacts located on the inside of said cover projecting downwardly for contact with said battery pack unit; an electrical connector in said cover electrically connected to said electrical spring contacts, said connector providing means on the outside of said cover for an electrical connection in order to derive voltage from said battery pack unit; and said pack unit comprising a plurality of batteries electrically connected to each other, said batteries enclosed in a housing which includes two pairs of metallic strips serving as electrical contacts, both pairs of strips electrically connected to said batteries so that one of said strips in each pair is a negative terminal and the other of said strips in each pair is a positive terminal, one pair of metallic strips located in a side portion of said housing and not making electrical contacts with said receptacle, the other pair of metallic strips located in the upper portion of said housing and adapted to be contacted by said spring contacts when said cover is closed to thereby provide a means of deriving energy from said pack unit.

4,160,858

SOLVENTLESS SILICONE RESINS

George F. Roedel, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 31, 1978, Ser. No. 873,802

Int. Cl.[2] C08F *11/04*

U.S. Cl. 528—14 **15 Claims**

1. A process for producing a solventless silicone resin having a viscosity at 100% solids varying from 200 to 5,000 centipoise at 25° C. comprising (a) adding to organo chlorosilanes of the formula,

$$R_a Si Cl_{4-a}$$

where R is selected from the class consisting of alkyl radicals, cycloalkyl radicals, alkenyl radicals, aryl radicals and fluoroalkyl radicals all having up to 8 carbon atoms and mixtures thereof where a is 1 or 2, from 0.05 to 0.2 part of water and from 0.1 to 1 part of an aliphatic alcohol of up to 3 carbon atoms per part of organochlorosilane to form a silicone alkoxylate; (b) heating the alkoxylate to reflux (c) inserting additional amounts of said aliphatic alcohol to said alkoxylate and removing said alcohol until the acid-content of said alkoxylate is below 1000 parts per million; (d) adding an alkali metal hydroxide to said alkoxylate until its acid content does not exceed 100 parts per million (e) adding water to said alkoxylate such that the amount of water that is added is from 0.2 to 0.8 moles of water per mole of hydrocarbonoxy radicals in said alkoxylate; and (f) heating said alkoxylate so as to effect the hydrolysis reaction with the additional water to obtain the desired resin product.

4,160,859

CURABLE MIXTURES BASED ON MALEIMIDES AND ACETONE-ANIL

Alfred Renner, Münchenstein, and Abdul-Cader Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

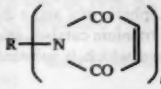
Filed Apr. 1, 1977, Ser. No. 783,571

Claims priority, application Switzerland, Apr. 8, 1976, 4441/76

Int. Cl.[2] C08G *69/26, 73/10*

U.S. Cl. 528—322 **5 Claims**

1. A curable composition which consists essentially of (a) a maleimide of the general formula I



(I)

wherein R denotes an n-valent aliphatic or aromatic radical, and n denotes the number 2; and (b) 2,2,4-trimethyl-1,2-dihydroquinoline, in such ratio that for 1 imido group

equivalent there is present 0.05 to 1 mole of 2,2,4-trimethyl-1,2-dihydroquinoline.

4,160,860
ACTIVE PLANT EXTRACTS OF HYPOXIDACEAE AND THEIR USE

Karl H. Pegel, Durban, South Africa, assignor to Roecar Holdings (Netherlands Antilles) N.V., Netherlands Antilles

Filed Dec. 1, 1977, Ser. No. 856,507

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659465

Int. Cl.[2] **C07G** *3/00;* **C07J** *17/00;* **A61K** *31/705, 35/78*

U.S. Cl. 536—5 **16 Claims**

1. In a process of preparing an extract of the family Hypoxidaceae comprising the steps of heating the plant material to a temperature sufficient to deactivate the sterolin specific degradative enzymes and then extracting or concentrating the improvement to obtain an extract which contains only traces of sterolins and sterolin compounds wherein the plant material is heated to at least 60° C. and thereafter extracted at 0° to 30° C. with an aqueous alcohol containing 30–75 volume percent ethanol for 1–15 days.

7. A process according to claim 1 comprising heating plant material of the plant *Hypoxis rooperi* to at least 60° C. immediately following comminution until the enzymes present are deactivated and then extracting the material at 0°–30° C. with aqueous alcohol containing 30–75 volume percent ethanol for 1–15 days.

9. An extract of a plant of the family Hypoxidaceae which has been prepared by the process of claim 1.

4,160,861
METHOD FOR THE SEPARATION OF ANTIBIOTIC MACROLIDES

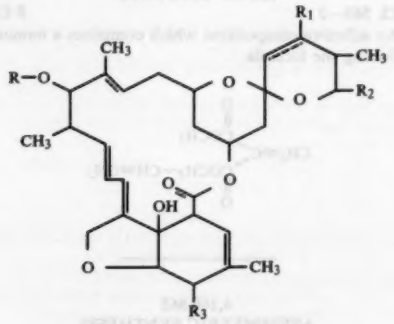
Douglas L. Cole, Roselle Park, and Robert T. Goegelman, Linden, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 3, 1977, Ser. No. 839,138

Int. Cl.[2] **C07H** *17/08*

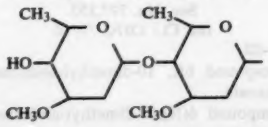
U.S. Cl. 536—17 A **8 Claims**

1. A method for the separation of C-076 components wherein said C-076 components have the formula:



wherein

R is:



and wherein the broken line indicates a single or a double bond;

R_1 is hydroxy and is present only when said broken line indicates a single bond.

R_2 is propyl or butyl; and

R_3 is methoxy or hydroxy, from a solution or broth containing a mixture of C-076 components obtained from the fermentation of a C-076 producing strain of Streptomyces avermitilis, wherein said solution or broth is chromatographed on a reverse hase high pressure liquid chromoatography column and wherein the elution solvent is methanol:water.

4,160,862
1-ACYL-3-(AMINO-LOWER-ALKYL)INDOLES

Bernard L. Zenitz, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

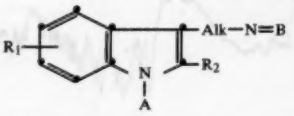
Continuation-in-part of Ser. No. 261,739, Jun. 12, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,279

Claims priority, application United Kingdom, Apr. 25, 1973, 19624/73

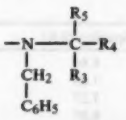
Int. Cl.[2] **C07D** *401/06, 209/14*

U.S. Cl. 542—439 **8 Claims**

1. A compound having the formula

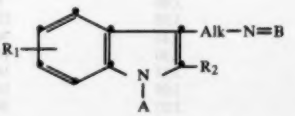


where Alk is lower-alkylene containing from two to seven carbon atoms; R_1 is hydrogen or from one to two members of the group consisting of lower-alkoxy and halogen; R_2 is hydrogen or lower-alkyl; A is benzoyl cinnamoyl, 2-thenoyl or 2-furoyl; and N=B is the group

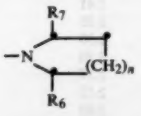


where R_3, R_4 and R_5 are each lower-alkyl, and wherein the phenyl ring of A when benzoyl can be substituted by from one to two members of the group consisting of lower-alkyl, lower-alkoxy or halogen; or a pharmaceutically acceptable acid-addition salt thereof.

5. A compound having the formula



where Alk is lower-alkylene containing from two to seven carbon atoms; R_1 is hydrogen or from one to two members of the group consisting of lower-alkoxy and halogen; R_2 is lower-alkyl; A is cinnamoyl; N=B is the group



where R_6 is cycloalkyl or cycloalkyl-lower-alkyl having from

three to seven ring carbon atoms in the cycloalkyl moiety and from one to five carbon atoms in the lower-alkyl moiety; R_7 is hydrogen; and n is one of the integers 1 and 2, and wherein the phenyl ring of A can be substituted by from one to two members of the group consisting of lower-alkyl, lower-alkoxy or halogen; or a pharmaceutically acceptable acid-addition salt thereof.

4,160,863

PROCESS FOR THE PREPARATION OF THE CRYSTALLINE MONOHYDRATE OF 7-[D-α-AMINO-α-(p-HYDROXYPHENYL)ACETAMIDO]-3-METHYL-3-CEPHEM-4-CARBOXYLIC ACID

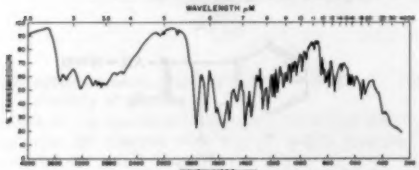
Daniel Bouzard, Franconville; Abraham Weber, and Jacques Stemer, both of Paris, all of France, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 785,392, Apr. 7, 1977, abandoned. This application Feb. 2, 1978, Ser. No. 874,457

Int. Cl.[2] C07D *501/22, 501/12*

U.S. Cl. 544—30 **19 Claims**

INFRARED SPECTRUM OF CEFADROXIL MONOHYDRATE



1. A process for the preparation of crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid monohydrate exhibiting essentially the following x-ray diffraction properties:

Line	Spacing d(A)	Relative Intensity
1	8.84	100
2	7.88	40
3	7.27	42
4	6.89	15
5	6.08	70
6	5.56	5
7	5.35	63
8	4.98	38
9	4.73	26
10	4.43	18
11	4.10	61
12	3.95	5
13	3.79	70
14	3.66	5
15	3.55	12
16	3.45	74
17	3.30	11
18	3.18	14
19	3.09	16
20	3.03	29
21	2.93	8
22	2.85	26
23	2.76	19
24	2.67	9
25	2.59	28
26	2.51	12
27	2.46	13
28	2.41	2
29	2.35	12
30	2.30	2
31	2.20	15
32	2.17	11
33	2.12	7
34	2.05	4
35	1.99	4
36	1.95	14

-continued

Line	Spacing d(A)	Relative Intensity
37	1.90	10

which process comprises

(a) silylating 7-aminodesacetoxycephalosporanic acid in an inert substantially anhydrous aprotic solvent;

(b) acylating the so-produced silylated 7-aminodesacetoxycephalosporanic acid with D(−)-α-amino-α-(p-hydroxyphenyl)acetyl chloride hydrochloride in an inert substantially anhydrous aprotic solvent in the presence of an acid acceptor;

(c) cleaving any silyl groups of the acylation product by hydrolysis or alcoholysis; and

(d) forming the desired monohydrate product by a method selected from

(1) upwardly adjusting the pH of the solution from step (c) in the presence of excess dimethylformamide to form the dimethylformamide solvate of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid; dissolving said dimethylformamide solvate in acidified water or a mixture of acidified water and acetonitrile, and upwardly adjusting the pH of said acidified solution to precipitate the desired crystalline monohydrate;

(2) upwardly adjusting the pH of the solution from step (c) in the presence of excess dimethylformamide to form the dimethylformamide solvate of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid and contacting said dimethylformamide solvate with water or a partially aqueous medium to precipitate the desired crystalline monohydrate.

4,160,864

ADHESIVE COMPOSITIONS COMPRISING METHYL ALLYL METHYLENEMALONATE

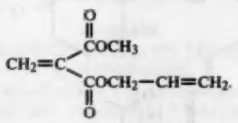
Ignazio S. Ponticello, Rochester, N.Y., and John M. McIntire, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 7, 1976, Ser. No. 721,148

Int. Cl.[2] C07C *69/38*

U.S. Cl. 560—2 **5 Claims**

1. An adhesive composition which comprises a monomeric ester having the formula



4,160,865

ASYMMETRIC SYNTHESIS

Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 723,401, Sep. 15, 1976, which is a division of Ser. No. 544,153, Jan. 27, 1975. This application May 16, 1977, Ser. No. 797,153

Int. Cl.[2] C07C *79/46*

U.S. Cl. 560—22 **2 Claims**

1. The compound 6R, 10-dimethyl-undecan-2-yn-4(R)-ol 3,5-dinitrobenzoate.

2. The compound 6(R),10-dimethyl-undecan-2-yn-4(S)-ol-3,5-dinitrobenzoate.

4,160,866

CARBAMATES

John L. Brooks; Richard Budziarek, and David J. Harper, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 767,331, Feb. 10, 1977, abandoned. This application Nov. 23, 1977, Ser. No. 854,252
Claims priority, application United Kingdom, Apr. 30, 1976, 17704/76

Int. Cl.[2] C07C *125/06*

U.S. Cl. 560—25 4 Claims

1. A carbamate compound of the formula:

$$R_1—O.CO.NHO.CO.X.CO.OHN.CO.O—R_1 \quad (I)$$

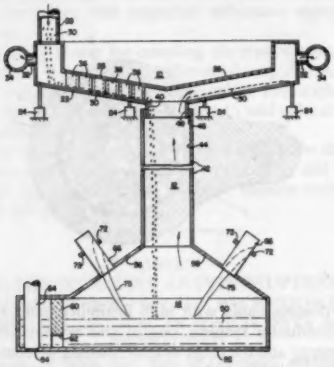
in which X is a member of the group consisting of a direct link, C_1 to C_4 alkylene groups, C_2 to C_3 alkenylene, o-phenylene and p-phenylene and R_1 is a member of the group consisting of C_1 to C_{18} alkyl, phenyl, chlorophenyl, nitrophenyl, cyclohexyl and benzyl.

4,160,867

METHOD AND APPARATUS FOR MELTING MACHINING CHIPS

Maurice G. Fey, Plum Borough, and Francis J. Harvey, II, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 17, 1977, Ser. No. 797,893
Int. Cl.[2] H05B 7/00; F27D 3/00
U.S. Cl. 13—2 P 5 Claims



1. Apparatus for melting metal chips comprising:
(a) a preheating chamber comprising a hearth having a substantially planar surface and being rotatable about a central vertical axis, inlet means for metal chip stock adjacent to one surface portion of the hearth, outlet means for preheated metal chip stock adjacent to another surface portion of the hearth, means for moving the metal chip stock from the inlet means to the outlet means,
(b) a pre-reducing chamber communicating with said outlet means,
(c) a melting chamber communicating with the preheating chamber,
(d) an arc heater having axially spaced, generally hollow, cylindrical electrodes forming an arc chamber communicating with the melting chamber,
(e) electric means for striking an electric arc in an axial gap between the electrodes,
(f) means for rotating the arc within the arc chamber,
(g) means for blowing non-oxidizing gas through the gap to form an elongated arc stream comprising the non-oxidizing gas and the arc, and
(h) the non-oxidizing gas flowing through the melting chamber, the pre-reducing chamber and the preheating chamber in countercurrent to the movement of metal chips through said chamber.

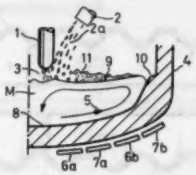
4,160,868

APPARATUS AND METHOD FOR MELTING FERROUS PELLETS

Jan Marchner, and Yngve Sundberg, both of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Nov. 23, 1976, Ser. No. 744,424
Claims priority, application Sweden, Nov. 28, 1975, 7513411
Int. Cl.[2] H05B 7/18
U.S. Cl. 13—11 3 Claims

1. An arc furnace for melting ferrous pellets which float on a ferrous melt, said furnace comprising a non-magnetic hearth for containing said melt, at least one arcing electrode positioned to form an arc on a central portion of said melt, feeding means for feeding said pellets substantially to said central portion, stirrer means formed by at least two substantially concentric radially inner and outer coils positioned adjacently below said hearth and substantially parallel therewith and substantially symmetrical with said central portion, and power means for feeding said coils with multiphase current having a phase sequence inductively propelling the bottom portion of said melt radially outwardly from below said central portion so



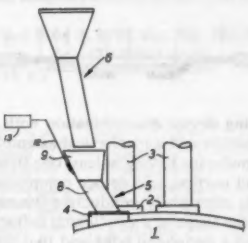
that the upper portion of the melt is caused to flow radially towards said central portion and float towards said central portion any of said pellets inadvertently floating on the melt remotely from the central portion thereof.

4,160,869

CONTINUOUS CHARGING APPARATUS

Andrew D. Robertson, Rotherham, England, assignor to British Steel Corporation, London, England

Filed Dec. 1, 1977, Ser. No. 856,222
Claims priority, application United Kingdom, Dec. 2, 1976, 50306/76
Int. Cl.[2] F27D 3/16
U.S. Cl. 13—33 16 Claims



1. Apparatus for continuously charging particulate feedstock into an electric arc furnace normally containing furnace gases under positive pressure, comprising a furnace housing, a gravity feed chute for the feedstock secured to the furnace housing to form a closed fluid flow path and communicating with the furnace interior, and means for supplying steam or other gases in said feed chute at a mass flow rate and velocity sufficient to create a momentum flux in the chute exceeding the blowout force in the chute of the furnace gases.

4,160,870

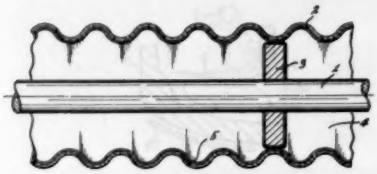
HIGH VOLTAGE DEVICE WITH GAS INSULATION

Jan Artbauer, Langenhagen, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed Apr. 26, 1973, Ser. No. 354,475
Claims priority, application Fed. Rep. of Germany, May 5, 1972, 2222681
Int. Cl.[2] H01B 9/06
U.S. Cl. 174—14 R 1 Claim

1. In a high voltage cable having concentric inner and outer conductors provided for conducting different voltage potentials and being separated by an insulative gas, the improvement comprising:
an adhesive layer deposited on the inner surface of the outer conductor only, and including pigmentation for enhancement of the radiation emission and absorption relative to the respective conductor surface portion, said surface having lower local electric field strength than the field

strength adjacent to the surface of the inner conductor when said different potentials are being applied to the inner and outer conductors, the layer being sticky and



exposed to the gas for gathering dust and dirt, particularly before said potentials are applied to the conductors, the surface of the inner conductor being free from such adhesive layer.

4,160,871

CONNECTING DEVICE FOR ACHIEVING THE ELECTRICAL JUNCTION AND MECHANICAL ASSEMBLY OF AT LEAST TWO CONDUCTORS

Jacques Lacroix, 94 Elysee II, La Celle Saint Cloud, France 78170

Filed Feb. 9, 1977, Ser. No. 766,904
Claims priority, application France, Feb. 17, 1976, 76 04300
Int. Cl.[2] H01R *5/10*
U.S. Cl. 174—84 R **21 Claims**

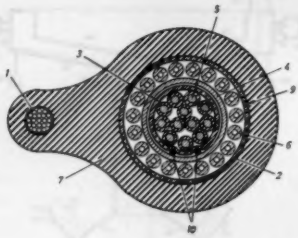
1. A connecting device in combination with and achieving an electrical junction and a mechanical assembly of two conductors, each conductor having at least one strand of wire and a bared wire end portion, said device comprising in combination an elongate electrically conductive connecting member substantially in the shape of a strip which defines two opposed side surfaces and a peripheral edge and two throughway orifices which are spaced apart from each other longitudinally of the strip, the bared end portions of the two conductors being respectively combined with the two orifices in contact zones between the strip and the bared end portions, each bared end portion comprising in the corresponding contact zone an extremity part extending substantially longitudinally alongside and adjoining a first of said surfaces of the strip, a second part extending substantially longitudinally alongside and adjoining a second of said surfaces of the strip and a third part interconnecting said extremity part and said second part and transversely extending through the respective orifice of said two orifices and imparting a labyrinth shape to the bared end portion, two tubular insulating terminals surrounding opposite end portions of the strip and covering said contact zones, each terminal defining with said first surface a first cavity receiving said extremity part of the bared end portion of the corresponding conductor and defining with said second surface a second cavity receiving said second part of the bared end portion of the corresponding conductor, means interposed between the terminals and the strip for slidingly mounting the terminals longitudinally on the strip, retaining means interposed between the terminals and the strip for retaining the terminals on the strip, longitudinally extending support means in said first cavity of each terminal in supporting contact with said extremity part of the bared end portion of the corresponding conductor, one of two elements consisting of the strip and the support means of each terminal being resiliently yieldable and in a condition in which it is resiliently stressed transversely of said first cavity in a direction away from the other of said elements by the extremity part of the bared end portion of the corresponding conductor for maintaining electrical contact between the strip and the corresponding bared end portion.

4,160,872

SELF-FLOATING CABLE FOR MARINE OPERATIONS

Bo E. O. Lundberg, Sundbyberg, and Victor Scuka, Upplands-Bälinge, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 10, 1977, Ser. No. 823,288
Claims priority, application Sweden, Aug. 24, 1976, 7609347
Int. Cl.[2] H01B *7/12, 7/18;* G02B *5/14*
U.S. Cl. 174—101.5 **1 Claim**



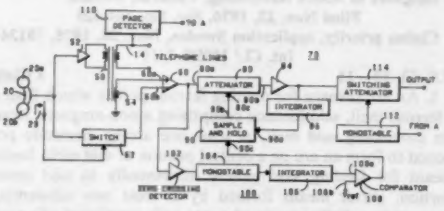
1. Self-floating cable with high flexibility, comprising two separate conductor systems, one of said systems transferring electric energy and the other system resisting mechanical loads applied longitudinally and transversely to the cable; a common cable mantle surrounding said two systems, said one system including an inner friction layer of plastic material having a low friction coefficient when contacting its own surface and surrounding inner conductors of the electric conductor system, said inner friction layer being wound about itself to form overlapped and overlapping portions; a metallic layer covering said friction layer, said metallic layer also being wound about itself to form overlapped and overlapping portions; a number of hollow cords of soft plastic material disposed in parallel and surrounding said metallic layer, said cords extending with a pitch along the longitudinal direction of the cable; and an outer friction layer of plastic material with a low friction coefficient when contacting its own surface, said outer friction layer covering said cords and being surrounded by the cable mantel and being wound about itself to form overlapped and overlapping portions, the low friction coefficient of said outer friction layer being such as to enable longitudinal movement of the said one system relative to said cable mantle, the low friction coefficient of said inner friction layer enabling relative longitudinal movement of the inner conductors and the remainder of the said one system.

4,160,873

LEVEL CONTROL CIRCUITRY FOR TWO WAY COMMUNICATION SYSTEM

Kermit Beseke, Schaumburg, and Ronald Kopecki, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1977, Ser. No. 846,747
Int. Cl.[2] H04L *5/14*
U.S. Cl. 178—58 R **7 Claims**



1. In a two-way communication system of the type wherein first and second stations generate first and second signals, A

and B, respectively, said signals being duplexed on a transmission medium coupled between the stations, the transmission medium exhibiting losses such that the amplitude of the signal B received at the first station is significantly less than the signal A generated by said station, the improvement for balancing the levels of said signals in the station A comprising:

differential amplifier means, having first and second inputs and an output, for amplifying the difference between signals appearing at its input by a predetermined factor and producing said amplified difference signals at the output;

first coupling means for coupling the transmission medium signal A+B to said first differential amplifier input; and

second coupling means for coupling the first station generated signal A in unmodified form to said second differential amplifier input,

such that the signal produced at the output of the differential amplifier means is said signal B amplified by said predetermined factor to thereby establish balance between the levels of said signals.

4,160,874

PROCESS FOR SIGNALING AN INTERRUPTION IN THE STATE OF READINESS FOR THE RECEPTION IN DATA TERMINAL DEVICES IN WHICH DATA ARE EXCHANGED

Max Öllinger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,455

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1976, 2639063

Int. Cl.[2] H04N *1/32;* H04L *25/02*

U.S. Cl. 178—69 G **7 Claims**

1. In a data transmission process in which each subscriber station is connected by way of a line to a telegraphic exchange and in which a calling station can selectively dial and establish a connection to a called station via a telegraphic transmission network, the connection being established between a calling station telegraphic data terminal device and a called station telegraphic data terminal device, in which permanent conditions cannot be transmitted by way of the telegraphic exchanges, and in which the calling station data terminal device requests that the called station data terminal device transmit a station identification code character, and in which data transmission begins after the called station data terminal device transmits and the calling station data terminal device receives the called station identification code characters, the improvement therein comprising the steps of:

monitoring for the presence or absence in the called station of a malfunction or disabling condition to determine the state of readiness of the called station data terminal device to receive data;

blocking the identification code character of the called station data terminal device to prevent transmission of the called station identification code character in response to interruption in the state of readiness to receive data; and

then, automatically clearing the established connection between the calling and called stations.

4,160,875

SECURITY SYSTEM

Leonard R. Kahn, 70 N. Grove St., Freeport, N.Y. 11520

Filed May 12, 1977, Ser. No. 796,123

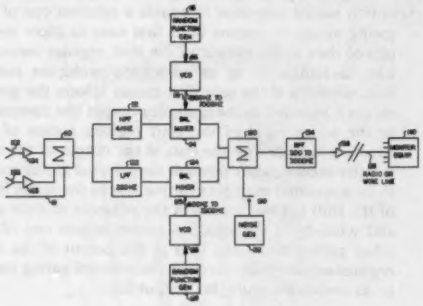
Int. Cl.[2] H04K *1/00*

U.S. Cl. 179—1.5 M **20 Claims**

1. The method of providing security for individuals without violating the privacy of their conversations, comprising:

(a) converting sound waves, including voice waves present at a location to be protected, to electrical waves,

(b) processing said electrical waves so as to substantially reduce the information borne by normal conversation speech waves while not substantially degrading the intelligibility borne by certain other waves outside the intelligible speech band which carry signals indicating emergency conditions, said waves being available for detection by monitoring personnel, and



(c) transmitting the waves processed by step (b) to a remote location.

4,160,876

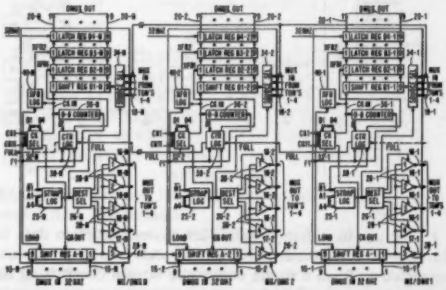
MODULAR MULTIPLEX/DEMULTIPLEX APPARATUS

Robert J. Bojanek, Newton, and Marvin S. Mason, Lexington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 1, 1978, Ser. No. 901,390

Int. Cl.[2] H04J *3/02*

U.S. Cl. 179—15 AT **11 Claims**



1. A modular multiplex/demultiplex apparatus, comprising:

a plurality of multiplex/demultiplex module units, each comprising:

a plurality of demultiplex input lines for receiving demultiplexed data thereon, the data on each line being in a serial bit format;

shift register means having a plurality of stages connected in series and each coupled to a different one of the plurality of demultiplex input lines, a series input for receiving data in a multiplexed format, and an output, said shift register means being operative to shift data applied to the plurality of stages thereof or to the series input thereof serially to the output thereof in a multiplexed format;

a plurality of multiplex output lines, one of said multiplex output lines representing a module interconnection line and being connected to the series input of the shift register means of an adjacent module unit;

a plurality of gating means each connected to a different one of the plurality of multiplex output lines and connected to the output of the shift register means, each of said gating means having a first operating state during which multiplexed data at the output of the shift register

means may pass therethrough to its corresponding multiplex output line and a second operating state during which multiplexed data at the output of the shift register means is inhibited from passing therethrough to its corresponding multiplex output line; and

selection means operative to enable a selected one of the gating means to operate in its first state to allow multiplexed data at the output of the shift register means to pass therethrough to its associated multiplex output line, whereby if the selection means selects the gating means connected to the multiplex output line connected to the series input of the shift register means of the adjacent module unit the data at the output of the shift register means passes through the selected gating means to its associated multiplex output line to the series input of the shift register means of the adjacent module unit, and whereby if the selection means selects one of the other gating means the data at the output of the shift register means passes through the selected gating means to its associated multiplex output line.

4,160,877

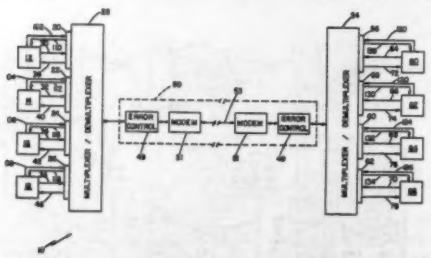
MULTIPLEXING OF BYTES OF NON-UNIFORM LENGTH WITH END OF TIME SLOT INDICATOR

James E. Vander Mey, Newtonville, Mass., assignor to Codex Corporation, Newton, Mass.

Continuation of Ser. No. 702,921, Jul. 6, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 775,419

Int. Cl.[2] H04J 3/16

U.S. Cl. 179—15 BA **16 Claims**



1. For use in a data transmission system wherein data in a plurality of constituent streams are received at a multiplexer, processed to form a single composite stream comprising time slots each carrying data from one constituent stream, transmitted in said composite stream over a communication link, and demultiplexed in a demutiplexer receiving said composite stream to recover the original plurality of constituent streams in separate form, the improvement comprising the combination of

a plurality of queues in said mulitplexer, each associated with one of said constituent streams and arranged and connected to receive and store data therefrom,

protocol-defining apparatus in said multiplexer defining a service sequence for said queues, each queue appearing at least once in said sequence, and a codeword set, the elements thereof being bit sequences of non-uniform length, said set being uniquely parsable and including a terminator codeword used to designate the end of a slot,

framing means in said multiplexer, communicating with said protocol-defining apparatus therein, and arranged and connected to emit a bit stream in a sequence of time slots corresponding to said defined service sequence, the data in any one slot being derived from its associated queue, and in the form of codewords from said codeword set, said framing means emitting terminator codewords to mark the ends of at least some slots, said bit stream being suitable for transmission over the link to a demultiplexer parsing and decoding and composite stream of bits received from said link, and emitting in separate form the original plurality of constituent data streams.

4,160,878

CONFERENCE CIRCUIT WITH DIGITAL-ANALOG AND ANALOG-DIGITAL CONVERSION

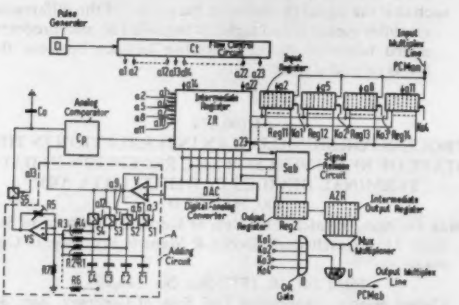
Peter Hirschmann, Puchheim, and Ernst Hoefer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,197

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732603; Aug. 5, 1977, 2735401

Int. Cl.[2] H04M 3/56

U.S. Cl. 179—18 BC **6 Claims**



1. A telecommunication conference circuit arrangement for use with a given maximum number n of conference subscribers each originating a digital signal on a multiplex input line, comprising:

(a) a signal acceptance means connected to the input line for accepting digital signals for conversion into analog signals;

(b) an intermediate register means connected to the signal acceptance means;

(c) a digital-analog converter connected to an output of the intermediate register means;

(d) an analog store means for storing an analog summation signal;

(e) an analog comparator means for comparing analog signals from the digital-analog converter with the analog summation signal stored in the analog store;

(f) signal allocation output device means connected to the output of the digital-analog converter;

(g) said signal acceptance means comprising n input registers, each input register being allocable to one of the conference subscribers and reading in corresponding digital signals from the subscriber;

(h) adding device means connected to an output of the digital-analog converter for forming the analog summation signal which is stored in the analog store from individual analog signals corresponding to each of the individual subscriber digital signals;

(i) said signal allocation output device means including an intermediate and output register means for transmitting the digital summation signal in respective time slots for the respective conference subscriber stations;

(j) clocked flow control means for creating a succession of clocked actuating signals for actuating in a given flow pattern the signal acceptance means, intermediate register means, digital-analog converter, adding device means, analog store means, analog comparator means, and signal allocation output device means; and

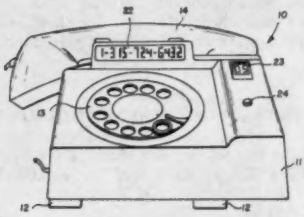
(k) said analog store, analog comparator, intermediate register, flow control means and digital-analog converter forming an analog-digital transducer means operating by itera-

tion to digitalize the analog summation signal and store it in the intermediate register.

4,160,879
TELEPHONE DISPLAY ACCESSORY

Ronald L. Sullivan, and Ronald R. Cosentino, both of Seneca Falls, N.Y., assignors to M E P & I Corporation, Seneca Falls, N.Y.

Filed Dec. 8, 1977, Ser. No. 858,710
Int. Cl.[2] H04M *1/56*
U.S. Cl. 179—90 AN **14 Claims**



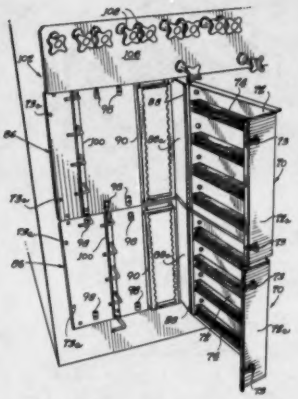
1. An accessory for a telephone having a body, a dial, a handset, and a line switch, said accessory comprising:
(a) a housing shaped to fit over an outside surface of said telephone body;
(b) a main switch disposed in the region of said line switch for actuating said accessory in response to movement of said handset;
(c) a rotatable element arranged within said housing to encircle and be concentric with said dial;
(d) means for releasably connecting said rotatable element to said dial for rotating with said dial;
(e) a dialing switch arranged within said housing to be responsive to said rotatable element to produce pulses as a function of rotation of said element;
(f) a dialed number display device; and
(g) electronic logic circuitry arranged within said housing and responsive to said pulses from said dialing switch for:
(1) displaying a dialed number digit-by-digit as said dialed number is dialed; and
(2) spacing said displayed digits to separate said displayed digits into groups conforming to telephone number digit groupings for local calls, long distance calls within area, and long distance calls outside of area as said dialed number is dialed.

4,160,880
MODULAR TERMINATION SYSTEM FOR COMMUNICATION LINES

William A. Brey, Schaumburg, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Jun. 2, 1978, Ser. No. 911,874
Int. Cl.[2] H04Q *1/14*
U.S. Cl. 179—98 **10 Claims**

1. An arrangement terminating telephone and like communication lines comprising a first field, said first field comprising a first plurality of dielectric connector blocks each having electrically conductive terminals thereon, the terminals having front and back sides that are respectively at opposite sides of the associated connector block, a panel-support upon which said blocks are mounted, and connectors having conductors extending therefrom and which are terminated at the back sides of said terminals and adapted for connections to telephone lines, a second field comprising a second plurality of dielectric connector blocks each having electrically conductive terminals thereon, the terminals of the second plurality of blocks also having front and back sides that are respectively at opposite sides of the associated connector block, means forming a support for said second plurality of terminal blocks, base means, a hinge connecting said last-mentioned support to the base means, additional connectors fixed relative to said base and having wires extending therefrom and to the back sides of the terminals of said second plurality of terminal blocks, a cable extending from each additional connector, each cable being a conductive extension of a plurality of said wires and



adapted for connections to further telephone lines, a plurality of cable guides receiving said cables and being offset from each other for locating the cables side-by-side as they run in a direction away from said first field, the cable guides being presented to said back sides of the second terminals, and means for routing jumper wires from the front sides of the terminals of one field to the front sides of terminals of the other field.

4,160,881
ELECTRET TRANSDUCERS: ACOUSTICALLY TRANSPARENT BACKPLATE OF SINTERED CONDUCTIVE SPHERES AND A THIN ELECTRET COATING; MESHLIKE DIAPHRAGM SPACING SCREEN OVERLAYS APERTURED ELECTRET BACKPLATE WITH SCREEN JUNCTIONS OVERLAYING THE APERTURES

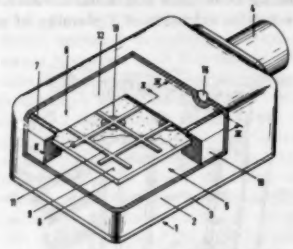
Adrianus J. Smulders, Hoogland, Netherlands, assignor to Microtel B.V., Netherlands

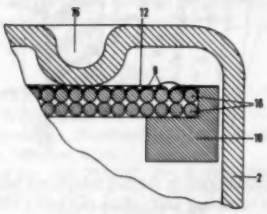
Filed Dec. 28, 1977, Ser. No. 865,138
Int. Cl.[2] H04R *19/00*
U.S. Cl. 179—111 E **7 Claims**

1. A motor assembly for an electret transducer comprising a diaphragm plate, a composite backplate including a plate-like body constituted by substantially spherical conductive particles sintered together and a thin coating of electret material disposed on the spherical particle surfaces of said plate-like body, thereby forming an acoustically transparent backplate having substantially spherical shaped protrusions constituted by said electret material opposite to said diaphragm plate, which rests on said protrusions along a substantially flat plane substantially tangent to the contours of said protrusions, and a mounting rim supporting said composite backplate and having a peripheral portion to which the outer edge portion of said composite diaphragm is attached, said diaphragm plate having a compliant surround at its periphery.

3. An electret transducer comprising in combination a casing and a motor assembly, said motor assembly comprising a diaphragm plate having a compliant surround at its periphery, a backplate, a plurality of apertures provided in said backplate, an electret foil disposed on said backplate, a meshlike spacing screen disposed on said electret foil opposite to said diaphragm plate, said diaphragm plate resting on said screen, the diaphragm plate supporting junctions of said screen overlying predetermined ones of said apertures, and a mounting rim

supporting said backplate along the periphery thereof, the outer edge portion of said diaphragm plate being attached to the peripheral portion of said rim substantially co-planar relative to said diaphragm, said mounting rim having an external





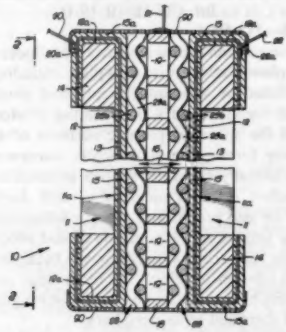
peripheral wall portion extending substantially perpendicular to the plane of said diaphragm plate said peripheral wall portion being acoustically sealed and attached to the opposite wall portion of said casing.

4,160,882

DOUBLE DIAPHRAGM ELECTROSTATIC TRANSDUCER EACH DIAPHRAGM COMPRISING TWO PLASTIC SHEETS HAVING DIFFERENT CHARGE CARRYING CHARACTERISTICS

Michael L. Driver, 3658 N. Fair Oaks Ave., Altadena, Calif. 91001

Filed Mar. 13, 1978, Ser. No. 885,642
Int. Cl.[2] H04R *19/02*
U.S. Cl. 179—111 R **11 Claims**



1. In an electrostatic loudspeaker, the combination comprising

(a) a pair of spaced, generally parallel diaphragms each of which includes a first sheet of plastic material and an electrically conductive layer adherent to said sheet,

(b) a pair of frames respectively peripherally mounting said diaphragms, the frames extending in parallel, spaced apart relation,

(c) a perforate, electrically conductive sheet sandwiched between said diaphragms, and

(d) foraminous sheets of dielectric material sandwiched between said perforate sheet and said diaphragms,

(e) whereby said diaphragms remain acoustically coupled through said foraminous dielectic sheets and through said perforate, electrically conductive sheet for simultaneous vibratory excursions when an AC signal is applied across said electrically conductive layers and said perforate sheet is connected to a common potential,

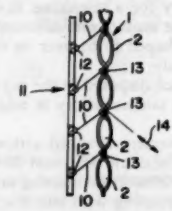
(f) each diaphragm also including a second sheet of plastic material sandwiched between the electrically conductive layer and one of said foraminous sheets of dielectric material, said second sheet having the capacity to carry a larger permanent static charge than said first sheet, said first and second sheets consisting of different plastic materials.

4,160,883

ACOUSTIC TRANSDUCER AND METHOD OF MAKING SAME

Oskar Heil, 1775 Parrott Dr., San Mateo, Calif. 94402

Filed Mar. 31, 1978, Ser. No. 892,416
Int. Cl.[2] H04R *7/00, 7/16, 31/00*
U.S. Cl. 179—114 M **46 Claims**



1. The method of making an acoustic transducer comprising the steps of:

(a) fabricating a light weight diaphragm;

(b) fabricating a heavy weight, structurally rigid base defining a supporting surface coextensive with said diaphragm and positioning said diaphragm in parallel relation to said supporting surface of said base;

(c) mechanically connecting said diaphragm to said base by dynamically rigid means defining with said diaphragm and said base a plurality of similar parallelograms with flexible corners, and

(d) mechanically connecting a drive means to said diaphragm.

7. An acoustic transducer comprising:

(a) light weight diaphragm means;

(b) heavy weight, structurally rigid base means defining a supporting surface parallel to and coextensive with said diaphragm;

(c) dynamically rigid means mechanically connecting said diaphragm to said base to define with said diaphragm and said base a plurality of similar parallelograms with flexible corners; and

(d) drive means mechanically connected to said diaphragm means.

4,160,884

POWER REGULATION SYSTEM FOR REPEATERED TELEPHONE TRANSMISSION LINES

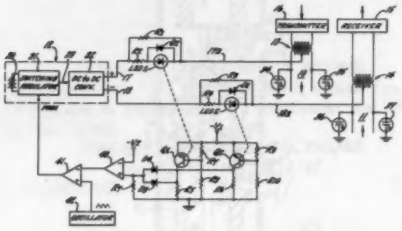
Larry D. Bishop, Colleyville, Tex., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Feb. 6, 1978, Ser. No. 875,330
Int. Cl.[2] H04B *3/44*
U.S. Cl. 179—170 J **6 Claims**

1. In a telephone transmission system having repeaters spaced along both the transmit and receive legs of the transmis-

sion line, a power supply for the repeaters including a current regulator, positive and negative supply lines connecting said power supply to the two legs of the transmission line, and current surge protectors connected from the two legs of said transmission line to ground,

a pair of current sensors responsive to the current levels in said positive and negative supply lines, between said power supply and the current surge protectors closest to said power supply, for producing output signals representative of the respective current levels,



control signal generating means receiving the output signals from said current sensors for producing a control signal in response to a deviation of the higher current in said supply lines from a preselected reference level, said control signal generating means including means for selecting the larger of the output signals from said current sensors, and means for producing said control signal in accordance with the deviation of the selected larger signal from said preselected reference level,

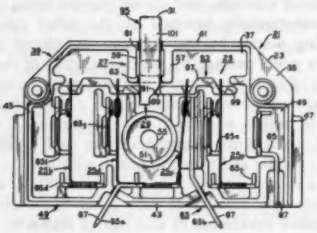
and means for supplying said control signal to said current regulator to maintain the higher current level in said supply lines at said preselected reference level.

4,160,885

ELECTRICAL SWITCH AND METHOD OF OPERATION

Harold B. Ellicott, Morrison, and James P. Frank, Rock Falls, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jan. 17, 1977, Ser. No. 759,875
Int. Cl.[2] H01H *9/00*
U.S. Cl. 200—1 R **15 Claims**



1. An electrical switch comprising:

(a) a housing having wall means defining a chamber in said housing, said walls means including at least a pair of generally opposite sidewalls, and another wall extending between said sidewalls and integrally formed therewith;

(b) an opening in said housing and extending through one of said sidewalls;

(c) a plurality of switch means in said chamber, each of said switch means of said switch means plurality including a pair of switch members at least one of which is movable, said at least one switch member being operable generally between a making position engaged with the other of said switch members and a breaking position disengaged therefrom, respectively;

(d) a plurality of switch means supporting terminals mounted with said housing so as to extend through said wall means with each of said terminals of said switch means supporting terminal plurality respectively including a supporting section within said chamber for supporting one of said at least one switch member and said other switch member, and an electrical connector section exteriorly of said chamber and disposed generally adjacent said wall means, only one pair of said terminals of said switch means supporting terminal plurality extending through the other of said sidewalls with said supporting section of one of said terminals of said only one terminal pair supporting at least one of said at least one switch member and with said supporting section of the other of said terminals of said only one terminal pair supporting said other switch member, and all of the others of said terminals of said switch means supporting terminal plurality extending through said another wall; and

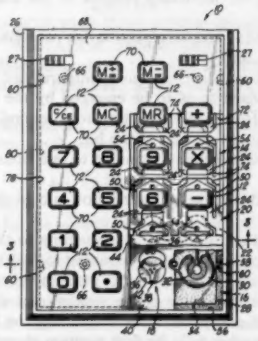
(e) means movable in said chamber for engaging and actuating each of said at least one switch member to effect the operation thereof from one of the making and breaking positions toward the other of the making and breaking positions thereof, respectively, said engaging and actuating means including means in said chamber for camming at least two of said at least one switch members from the one of the making and breaking positions toward the other of the making and breaking positions thereof prior to the operation of the other of said switch members from the one of the making and breaking positions to the other of the making and breaking positions thereof, respectively, and means integral with at least a part of said engaging and actuating means and extending through said opening exteriorly of said chamber for receiving a force to effect the movement of said engaging and actuating means so as to operate said each of said at least one switch members.

4,160,886

KEYBOARDS AND METHODS OF MAKING KEYBOARDS

Duane H. Wright, deceased, late of Coeur d'Alene, Id. (by Greta B. Wright, personal representative), and Stephen F. Meyer, Hayden Lake, Id., assignors to Clare-Pendar Co., Post Falls, Id.

Filed Jul. 21, 1977, Ser. No. 817,550
Int. Cl.[2] H01H *13/70*
U.S. Cl. 200—5 A **9 Claims**



1. A keyboard assembly comprising:

support means;

a switching assembly mounted on said support means and including a plurality of pressure actuated switch means;

and a key array overlying said switching assembly for selective actuation of said switching means;

said key array including a sheet of plastic of uniform thickness having been formed while in a pliant state into a generally flat base portion and a plurality of projecting keys each corresponding with one switching means;

apertures in said plastic sheet partially surrounding each of said keys and freeing said keys for movement relative to said base portion;

integral hinge portions of said plastic sheet interconnecting said base portion with said keys; and

a switch actuating means on each key and aligned with one of said switch means.

8. A key array for operating a switching assembly in a data entry keyboard, said key array comprising:

a one-piece, integral body formed from thermoplastic sheet material of uniform thickness by sequential sheet forming and cutting operations;

said body including a generally planar base portion;

a plurality of keys extending upwardly from said base portion;

apertures in said body partially separating said keys from said base portion; and

integral hinges connecting said keys to said base portion.

4,160,887

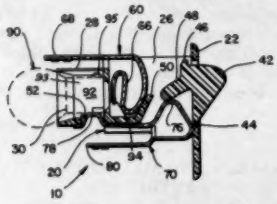
CLOSURE ACTIVATED SWITCH

Harold S. van Buren, Jr., Lexington, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 8, 1977, Ser. No. 822,461

Int. Cl.[2] H01H *3/16*

U.S. Cl. 200—61.62 **17 Claims**



1. A switch for mounting relative to a compartment having an access opening closable by a closure lid, said switch being activated to energize and de-energize a lamp bulb for illuminating the compartment in response to the opening and closing, respectively, of the closure lid, said switch comprising:

A. a housing for mounting relative to the compartment and including

i. a lamp bulb receiving portion for receiving and retaining the bulb, and

ii. a hinge member formed as an integral part of said housing and disposed so as to be engaged by the closure lid and pivoted from a first position to a second position in response to the closing of the lid;

B. a first contact member mounted to said housing and including

i. a first end portion for connection into an electrical circuit, and

ii. a second end portion for connecting to the bulb, and

C. a second contact member mounted to said housing, electrically isolated from said first contact member and including

i. a first end portion for connection into the electrical circuit,

ii. a second end portion for contacting the bulb when said hinge member is in its first position thereby to complete the electrical circuit through the bulb and energize the bulb,

iii. said second end portion being movable away from the bulb when said hinge member is pivoted to its second position thereby to open the electrical circuit and de-energize the bulb.

4,160,888

PUFFER-TYPE GAS-BLAST CIRCUIT BREAKER

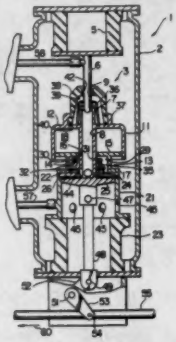
Ken-ichi Natsui; Kunio Hirasawa; Yoshio Yoshioka, and Hiroshi Chida, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1977, Ser. No. 802,940

Claims priority, application Japan, Jun. 10, 1976, 51/67987; Jun. 10, 1976, 51/67989

Int. Cl.[2] H01H *33/70, 33/88*

U.S. Cl. 200—148 A **16 Claims**



1. A puffer type gas-blast circuit breaker including at least one interrupting unit mounted in a vessel filled with an arc extinguishing gas of an unitary pressure, said interrupting unit comprising:

a pair of contacts positioned in alignment with but in opposed relation to each other, and movable toward and away from each other respectively, at least one of said pair of contacts having therein an axial hollow portion, said axial hollow portion having an opening in that axial free end face of said one contact, which is opposed to the other contact, whereby an arc is established between said pair of contacts, upon disengagement of said pair of contacts from each other;

a first cylinder and a first piston within said first cylinder to define a compression chamber filled with an arc extinguishing gas, said first cylinder and piston being movable relative to each other in association with the relative movement of said pair of contacts;

an insulating nozzle encompassing a free end portion of said one contact and having a throat portion in alignment with said pair of contacts, said throat portion being capable of being substantially blocked by the other contact, said insulating nozzle having an inner peripheral surface to define a guide passage by the cooperation of the free end portion of said one contact, and said guide passage bringing said compression chamber into communication with said axial hollow portion through said opening, when said pair of contacts are disengaged from each other;

a second cylinder and a second piston within said cylinder to define a suction chamber, said second cylinder and piston being movable relative to each other in association with the relative movement of said pair of contacts;

a first communicating means for bringing said axial hollow portion in communication with said suction chamber, whereby when said pair of contacts are relatively moved away from each other, an arc extinguishing gas in said compression chamber is compressed, and a volume of said suction chamber is enlarged, and when said pair of contacts are disengaged from each other, a pressure difference between said compression chamber and said suction chamber causes said arc extinguishing gas to be directed from said compression chamber via said guide passage, said axial hollow portion and said first communicating means, into said suction chamber, thereby to be blown against an arc produced between said pair of contacts; and

gas bleeding means for bleeding an arc extinguishing gas from said suction chamber into a space in said vessel by bringing said suction chamber into an open condition to or communication with a space in said vessel, when said pair of contacts are moved a given distance in the directions away from each other.

4,160,889

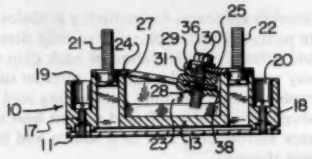
ELECTRICAL TERMINAL BLOCK

Jere W. Tognazzini, 7301 Lakewood Blvd., Dallas, Tex. 75214, and Kenneth R. Humphreys, 5737 McComas, Apt. 208, Dallas, Tex. 75206

Filed Dec. 15, 1977, Ser. No. 860,683

Int. Cl.[2] H01H *1/38, 1/42*

U.S. Cl. 200—163 **7 Claims**



1. In an electrical terminal block of the kind having an insulative base; a pair of spaced posts on said base; a pair of parallel fixed links connected to said posts and extending toward each other, one of said fixed links being relatively long, and the other being relatively short; and a movable link slidingly mounted on said long link for movement between a connected position in which it engages both fixed links, and a disconnected position in which it engages only said one link; the improvement which comprises:

said one link being formed of flat electrically conductive material and having an elongated closed-ended slot formed therein axially of the link, the end of said slot adjacent its associated post being squared off, and the other end of said slot being rounded;

said other link being formed of flat electrically conductive material and having a slot therein, the end of said slot adjacent its associated post being rounded and aligned with the rounded end of the slot of said first link, and the other end of said slot being open;

said movable link being formed of three layers of electrically conductive material, two of said layers being proportioned and arranged to lie on top of said one link and fit under said other link in the connected position and the third of said layers being proportioned and arranged to lie under said one layer and being connected to one of said first layers by a substantially flat tab passing through the slot in said one link;

said movable link being provided with a locking screw passing through all three layers of the movable link, through the slot in said one link, and, when the movable link is in the connected position, through the slot in said other link;

said parts being proportioned so that when said movable link is in the connected position said locking screw is abutted against the aligned rounded ends of said slots and the third layer of said movable link is abutted against a surface of said insulative base, and when said movable link is in the disconnected position, said substantially flat tab is abutted against the squared-off end of the slot in said one link.

4,160,890

APPARATUS FOR INDICATING THE POSITION OF ROTATING MECHANICAL ELEMENTS

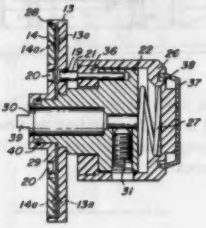
Gerald L. P. Chard, Taunusstein; Joachim Haupt, Wiesbaden, and Werner Zuber, Hemsbach, all of Fed. Rep. of Germany, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 15, 1977, Ser. No. 788,050

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618114

Int. Cl.[2] H01H *9/00*

U.S. Cl. 200—308 **6 Claims**



1. A switching apparatus for positioning indicating dials, comprises:

a first rotatable shaft,

a first dial skirt having a first array of indication symbols disposed thereon on a plane transverse to the axis of said first rotatable shaft,

means for coupling said first dial skirt to said first rotatable shaft so that said first dial skirt can be rotated by said first rotatable shaft about the axis thereof,

a second rotatable shaft co-axially disposed with said first rotatable shaft,

a second dial skirt having a second array of indication symbols disposed thereon on a plane transverse to the axis of said first rotatable shaft, said second dial skirt fixedly mounted on said second rotatable shaft,

a rotatable knob for rotating said first rotatable shaft to rotate said first dial skirt while said knob is held in a first position, and

means for coupling said first rotatable shaft to said second rotatable shaft so that they can be rotated in synchronism about the axis of said first rotatable shaft by said knob while said knob is pressed in the axial direction into and held in a second position.

4,160,891

FURNACE FOR THE INDUCTIVE HEATING OF METALLIC WORKPIECES

Friedrich Scheffler, Remscheid, Fed. Rep. of Germany, assignor to AEG-Elotherm, G.m.b.H., Remscheid, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,096

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642099

Int. Cl.[2] H05B *5/16*

U.S. Cl. 219—10.69 **4 Claims**

1. A furnace for the inductive heating of metallic workpieces comprising;

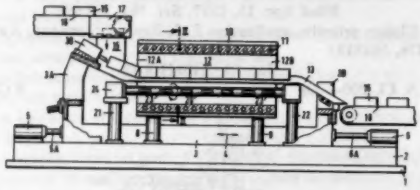
an induction coil body encompassing the furnace space;

a workpiece receiver for receiving workpieces and transporting said workpieces through such furnace space in a longitudinal direction, said receiver including a pair of hollow tubes extending through such space in parallel;

driving means outside said coil body for causing reciprocating forward and backward movement of said receiver in said longitudinal direction; and

means within said furnace for lifting said workpieces from said receiver during backward movement of said receiver so that said workpieces remain longitudinally stationary

during said backward movement of said receiver, said workpieces advancing through said furnace space during said forward movement of said receiver, said lifting means including a pair of rotatable bars extending through said



space below said tubes, said bars having cam surfaces thereon and means for rotating said bars so that said cam surfaces engage said workpieces to lift said workpieces from said tubes.

4,160,892

METHOD AND APPARATUS FOR SEAM WELDING OVERLAPPED EDGES

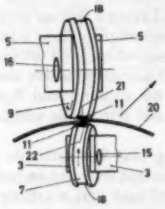
Paul Opprecht, im hinteren Bernold, Bergdietikon, Switzerland 8962, and Martin Kaul, Bellikon, Switzerland, assignors to Paul Opprecht, Bergdietikon, Switzerland

Filed Mar. 18, 1976, Ser. No. 668,312

Claims priority, application Switzerland, Mar. 19, 1975, 3483/75; Jul. 21, 1975, 9488/75

Int. Cl.[2] B23K *11/06*

U.S. Cl. 219—83 **18 Claims**



1. A method for longitudinally seam welding two overlapping metal sheet edges which comprises feeding two sheet edges of similar thickness to a welding station having opposed rollers on opposite sides of said overlapped sheets, guiding said edges along rigid guide means and biasing said edges toward said rigid guide means by resilient means, other than the metal sheet, which engages said sheet to cause said sheet edges to be in accurate overlapping relationship at said welding station, said overlapped being no more than 6 times the thickness of the edges, continuously feeding a pair of flat wire electrodes to the welding station between the rollers at the same rate as the overlapped edges and passing the overlapped edges in a longitudinal direction between said pair of electrodes so that the electrodes are located on opposite sides of the overlapped seam, said electrodes having a width of from 2 to 3 times that of the overlap, compressing the overlapped edges together between said electrodes at the welding station and simultaneously energizing the electrodes to thereby longitudinally seam weld the overlapped edges whereby the edges are welded with a continuously renewable electrode surface and the seam extends beyond the overlapped region into adjacent portions of the non-overlapped regions of the sheet edges, whereby the outer sheet edges are welded to the adjacent sheet to prevent each outer sheet edge from bending away from the adjacent sheet.

4,160,893

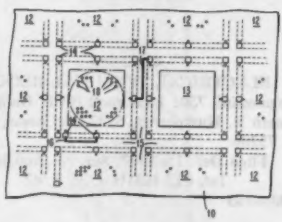
INDIVIDUAL CHIP JOINING MACHINE

Robert H. Meyen, Salt Point; Karl J. Puttlitz; Karl Schink, both of Wappingers Falls, and Herbert Wenskus, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,768

Int. Cl.[2] B23K *1/00, 1/04*

U.S. Cl. 219—85 BA **14 Claims**



1. In soldering apparatus for multichip modules each having a substrate provided with a plurality of chip sites on one face thereof, and wherein the elevation of each chip site within a module may vary and the thickness of different substrates may vary, a combined chip handling and heating tool comprising:

a selectively energizable infrared radiant heat source,

a reflector surrounding said heat source and having a first opening therein,

a quartz plate covering said first opening,

and a shield covering said plate and having a second opening therein thru which said radiant energy passes, said reflector being operative to direct radiant energy through said plate and said first and second openings and concentrate such energy in a focal plane over an area of substantially the same size as a chip, said plane being external to said tool and located a fixed distance therefrom;

said shield being operative to limit said radiant energy to only the chip being worked on by said tool, said shield having a conical tip extending from said plate and terminating in an edge surrounding said second opening, said edge being adapted to engage a chip;

first means adapted to selectively connect said tool to a vacuum source for selectively holding a chip against said edge;

said tip and plate defining a chamber communicating with said first means whereby the lower pressure is said chamber due to connection to the vacuum source allows a chip to be held against said edge due to atmospheric pressure;

and second means for producing relative movement between said tool and a chip site to locate a chip thereon and to locate said tool so that solder on the chip is in said focal plane of said radiant energy.

4,160,894

METHOD AND APPARATUS FOR THE FOCAL FORM CUTTING OF A MOVING WEB OF MATERIAL BY A LASER BEAM

Kurt Stemmler, Neuwied; Peter Langenbeck, Frickingen, and Günter Ehlscheid, Neuwied, all of Fed. Rep. of Germany, assignors to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG, Neuwied am Rhein, Fed. Rep. of Germany

Division of Ser. No. 685,601, May 12, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,569

Claims priority, application Fed. Rep. of Germany, May 14, 1975, 2521530

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 L **6 Claims**

1. An apparatus for focal form cutting of a two-dimensional pattern on a moving web of material by means of a laser beam, wherein the focal lens of the laser beam is moved only in a

plane parallel to the web in a circular path with further components of movement being superimposed thereon, and wherein all components of movement are variable in speed and controlled independently of one another, said apparatus including:

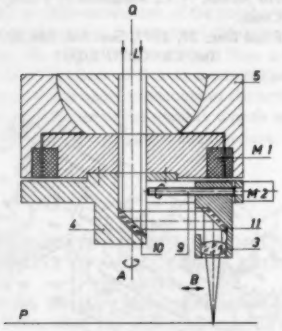
a laser beam source,

a lens focussing the laser beam on said web, the improvement comprising:

a rotatable lens carrier,

means for attaching said lens eccentrically to the axis of rotation of said rotatable lens carrier on said lens carrier such that the optical axis of the lens is substantially parallel to the axis of rotation of said rotatable lens carrier,

means for passing the laser beam through the axis of rotation of the lens carrier,



surface mirrors carried by said rotatable lens carrier for passing said laser beam from said rotatable lens carrier axis of rotation of said lens axis,

a bearing element for said lens carrier and arranged on a rotatable carrier whose axis of rotation is parallel to the axis of rotation of the lens carrier and is spaced radially therefrom, and

means for independently driving said rotatable lens carrier about its axis of rotation and for driving said bearing element about its axis of rotation;

whereby, a two-dimensional pattern form cutting of the moving web is achieved whose greatest radius is determined by the eccentricity of the lens in relation to the lens carrier axis of rotation and the distance between the axis of rotation of said lens carrier and said bearing element.

4,160,895

WELDING MACHINE FOR VALVE HOUSINGS

Troy K. Hopper, 5943 Nunn, Houston, Tex. 77086

Filed Feb. 9, 1977, Ser. No. 766,912

Int. Cl.[2] B23K *9/04*

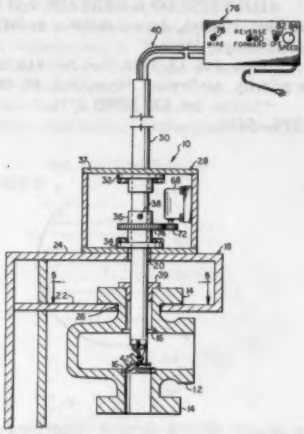
U.S. Cl. 219—125.1 **11 Claims**

1. Apparatus used in the rebuilding of the body of a valve, comprising:

electrical welding means for adding material inside the valve body having an electrode to provide an arc;

first support means having a first portion including an opening for detachably supporting the valve body, the first portion being aligned with a hole in a second portion of the support means,

second support means for rotably supporting the electrode of said welding means in a relatively fixed relationship to the valve body having an elongate tubular member extending through the hole in said first support means second portion and through the opening in the first portion; and



dirving means for rotating the tubular member and electrode about the elongate axis of the tubular member for adding the material to a desired location in the valve body.

4,160,896

HEAT DEVELOPING DEVICE FOR LOCALLY HEAT DEVELOPING A DRY PHOTOSENSITIVE FILM

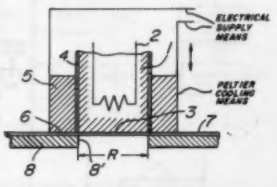
Ryo Fujimori, and Hiromi Ito, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1977, Ser. No. 843,348

Claims priority, application Japan, Oct. 21, 1976, 51-125458

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—216 **3 Claims**



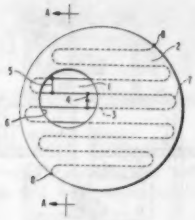
1. A heat developing device for a photo-sensitive film having at least one portion to be heat-developed, said device comprising a supporting means for supporting said photosensitive film and having an opening which is equal in configuration to said portion to be heat developed, a heating means provided at its lower side with a heating surface brought into contact with said portion of said photosensitive film and locally heating and heat-developing said portion only, and a cooling means surrounding said heating means and placed in contact with the periphery of said portion to be heat-developed, said cooling means including means for forcedly cooling the periphery of said portion thereby preventing heat transfer thereto.

4,160,897

CERAMIC HEATING ELEMENT WITH RESTIVITY ADJUSTED TO A CERTAIN VALUE

Yoichi Makino, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 13, 1978, Ser. No. 915,099
Claims priority, application Japan, Jun. 14, 1977, 52-69450
Int. Cl.[2] H05B *3/16*
U.S. Cl. 219—543 **9 Claims**



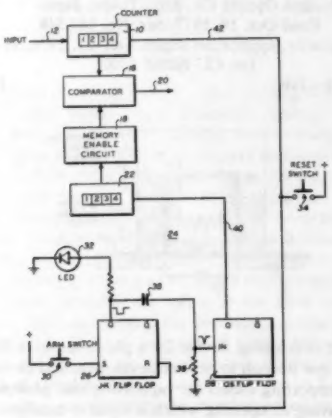
1. In a ceramic heating element comprising a ceramic substrate having on a surface thereof a resistor pattern of an electrically conductive material and a ceramic electrically insulating layer disposed on the surface of the ceramic substrate with the resistor pattern thereon, the improvement wherein the ceramic electrically insulating layer includes an opening through which a part of the resistor pattern is exposed, the effective length of the resistor pattern being changed through said opening, whereby the resistivity of the resistor pattern is adjusted to within a particular range, and a heat resistant electrically insulating coating filling the opening in the ceramic electrically insulating layer.

4,160,898

SAFETY CIRCUIT TO PREVENT THE OBTAINING OF A FALSE COUNT FROM PRESETTABLE COUNTERS

Joseph Gaou, 64-50 229th St., Bayside, N.Y. 11364

Filed Nov. 25, 1977, Ser. No. 854,520
Int. Cl.[2] G06M *3/02*; H03K *21/36*
U.S. Cl. 235—92 PE **6 Claims**



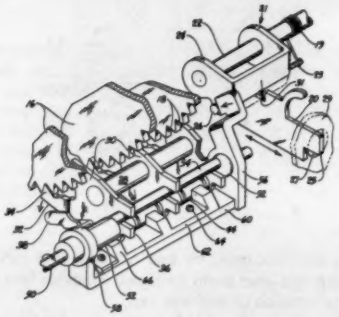
1. In a counting device having a load register for registering a count characteristic of units to be counted, a memory enable circuit adapted for storing a number characteristic of the required number of units to be counted, a comparator coupled to both said load register and said memory enable circuit for providing an output when the load register reaches a count equal to the number stored in said memory enable circuit, an adjustable display device coupled with said memory enable circuit and adapted to transfer thereto of different numbers, and a safety switch circuit having a first flip-flop responsive to said load register completing its count, a second flip-flop coupled with said first flip-flop, and reset means coupled with said first flip-flop, said first flip-flop being responsive to said reset means upon activation thereof for triggering of said second flip-flop, means coupling the output of said second flip-flop with said display device for transferring the number in said display device to said memory enable circuit upon triggering of said second flip-flop.

4,160,899

DETENT REMOVER FOR A POSTAGE METER

James G. Montagnino, Monroe, Conn., and Frederick J. Staudinger, North Salem, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 27, 1977, Ser. No. 864,207
Int. Cl.[2] G07G *1/00*
U.S. Cl. 235—101 **8 Claims**



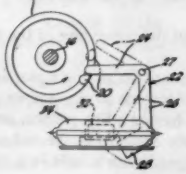
1. In a postage meter of the type having a housing containing a plurality of selector gears in operative engagement with print wheels for changing the setting of the print wheels upon actuation of the selector gears, the combination comprising: eccentric means rotatably received with the housing, detent means rotatably supported within the housing having a first portion in engagement with a selector gear and a second portion engageable with said eccentric means whereby upon rotation of said eccentric means said detent means rotate out of engagement with said selector gear.

4,160,900

MILEAGE SWITCH AND LATCH MEANS

John A. Carol, Jr., Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1978, Ser. No. 868,608
Int. Cl.[2] G01C *22/00*; G06M *3/00*
U.S. Cl. 235—132 E **3 Claims**



1. In a vehicular odometer having an array of cylindrical coaxial number wheels interconnected to rotate stepwise in digital counting action and in sequence to indicate numerically

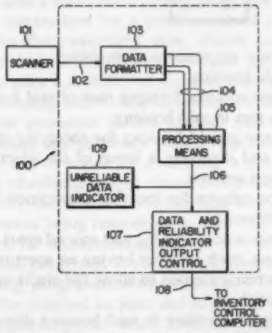
the cumulative vehicle travel, for use with a device to be controlled upon attainment by the vehicle of a predetermined cumulative travel, the improvement comprising magnetically actuated switch means operatively connected to the device to be controlled for selectively controlling same, a permanent magnet positioned adjacent the magnetically actuated switch means so as to direct its lines of flux through a predetermined space toward the magnetically actuated switch means for magnetically actuating the switch means, magnetic shunt means pivotally mounted adjacent a predetermined one of the number wheels and positioned so as to be selectively pivotable into the space between the permanent magnet and the magnetically actuated switch means to provide a shunted magnetic path for the lines of flux away from the magnetically actuated switch means, and actuating means formed at a predetermined location on the predetermined one of the number wheels indicative of the predetermined cumulative vehicle travel for selectively pivoting the magnetic shunt means from a first position out of the path of the lines of flux to a second position in the path of the lines of flux upon movement of the actuating means by the predetermined one of the number wheels into an operative relationship with the magnetic shunt means.

4,160,901

COINCIDENCE TESTING METHOD FOR ENHANCING THE RELIABILITY OF OUTPUT DATA FROM A LABEL READER

Sadao Nakanishi; Kazuhiro Suzuki; Nobufumi Tokura, and Shinichiro Endo, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1978, Ser. No. 891,218
Claims priority, application Japan, Apr. 22, 1977, 52-46990
Int. Cl.[2] G06K *5/00, 7/14;* G08C *9/06*
U.S. Cl. 235—437 **2 Claims**



1. A coincidence testing method for enhancing the reliability of the output data from a label reader having a scanner and adapted to read a bar code consisting of a plurality of bars comprising the steps of:

obtaining a set of at least three binary signals, each signal in said set being representative of a particular different point along a particular bar as scanned by the scanner;

ordering said binary signals in said set in a sequence corresponding to the ordering of the particular different points along the particular bar;

testing successive adjacent pairs of said ordered binary signals for coincidence;

providing a binary output decision for the particular bar if predetermined coincidence tests are met; and

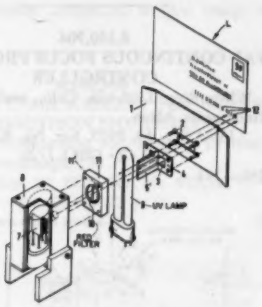
determining that a reliable output decision cannot be made for the particular bar if predetermined coincidence tests are not met.

4,160,902

OPTICAL READING HEAD

Hans van Wijngaarden, Leidschendam, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed Dec. 14, 1977, Ser. No. 860,627
Claims priority, application Netherlands, Dec. 23, 1976, 7614338
Int. Cl.[2] G01N *21/38*
U.S. Cl. 250—461 R **3 Claims**



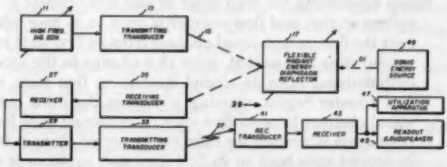
1. Optical reading head, particularly for reading luminescent code bars on documents and the like, which reading head comprises: a source of light for irradiating the bars, a detector for collecting the rays emitted by the bars, a filter material transmitting ultraviolet radiation at least adjacent the documents, and a hollow tubular optical guide for the filtered rays to said detector.

4,160,903

ELECTRO-OPTICAL RADIO SYSTEM

John C. McKechnie, and Herbert Berke, both of Maitland, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 7, 1977, Ser. No. 840,201
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **30 Claims**



1. A communication system, comprising in combination:

means for generating a first electrical signal having a predetermined frequency greater than zero Hertz;

means connected to the output of said first electrical signal generating means for transducing the first electrical signal generated thereby into a first radiant energy signal having a frequency identical thereto and for effecting the broadcast thereof along a first path;

means spatially disposed along said first path from said transducing means for receiving said first radiant energy signal therefrom and for effecting the timely reflection thereof as a second radiant energy signal along a second path that is different from the aforesaid first path, said first radiant energy signal receiving and reflection effecting means being sufficiently flexible to be vibration responsive to a

predetermined third radiant energy signal received from along a third path;

means spatially disposed along said second path for receiving said second radiant energy signal after the reflection thereof by the aforesaid receiving and reflection effecting means and for transducing it into a second electrical signal proportional thereto; and

means connected to the output of said second radiant energy signal transducing means for effectively broadcasting a fourth signal that is proportional to said second electrical signal throughout a predetermined ambient environmental medium.

4,160,904

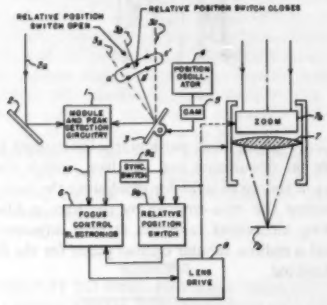
DIGITAL CONTINUOUS FOCUS PROPORTIONAL CONTROLLER

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 19, 1977, Ser. No. 834,852

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—201 **10 Claims**



1. Apparatus for use with an autofocus system which includes an optical element to be positioned proximate the desired focus position, the system producing first, second and third output signals, each of which may alternate between first and second states during operation of the system, comprising:

a first counter having a reset input and an output;

a first latch having a load input, a second input and an output;

means connecting the reset input of said first counter to the system so that said first counter is reset to its base whenever the first output signal changes from its first state to its second state and so that, prior to a change in the second output signal from its second state to its first state, said first counter begins counting whenever the third output signal changes from its first state to its second state but is reset again whenever the third output signal changes from its second state back to its first state and, subsequent to a change in the second output signal from its second state to its first state, said first counter is reset to its base and starts counting without being again reset until at least the first output signal changes from its second state back to its first state;

means connecting the second input of said first latch to the system and connecting the load input of said latch to the output of said first counter so that prior to a change in the second output signal from its second state to its first state, said first latch is loaded from and follows the count of said first counter but when there is a change in the second signal from its second state to its first state, said first latch holds its count until either (i) the third output signal changes to its first state, in which case said first latch is again loaded from and follows said first counter until there is a subsequent change in the third output signal to its second state, at which time said first latch again holds its count or (ii) a change in the first signal from its second state to its first state; and

motive means connected to the output of said first latch and to the optical element and operable to move the optical element in accordance with the count in said first latch when the first signal changes from its second state to its first state.

4,160,905

ELECTRON MICROSCOPES

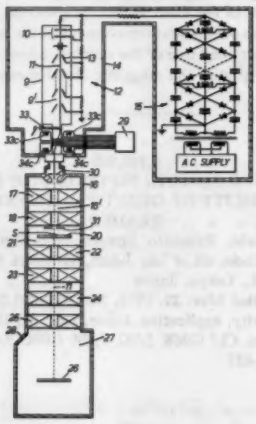
Julian P. Davey, Manchester, England, assignor to Kratos Limited, England

Filed Nov. 18, 1977, Ser. No. 852,717

Claims priority, application United Kingdom, Nov. 27, 1976, 49581/76

Int. Cl.[2] G01N *23/00*

U.S. Cl. 250—311 **5 Claims**



1. An electron microscope comprising

an evacuable housing,

a microscope column, forming part of said housing,

an electron gun in said housing,

an accelerator in said housing for receiving electrons from the gun and directing a beam of the electrons into the microscope column,

means in the column for locating a specimen in a specimen position therein,

two members in said housing and spaced apart on the axis of the column, each member having an aperture therein, the apertures being aligned to allow the electron beam to pass therethrough,

an ion-stopping member in said housing disposed with respect to said members to block the straight line paths along which any ions could otherwise pass through said apertures to said specimen position and

electron guide means for constraining said beam of electrons travelling from the electron gun to the specimen position to follow a path which avoids the ion-stopping member.

4,160,906

ANATOMICALLY COORDINATED USER DOMINATED PROGRAMMER FOR DIAGNOSTIC X-RAY APPARATUS

Herbert E. Daniels, Brown Deer; Paul M. Stivender, Waukesha; Paul C. Schanen, Wauwatosa, and Robert V. King, Waukesha, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,218

Int. Cl.[2] A61B *6/00*; H05G *1/46*

U.S. Cl. 250—322 **14 Claims**

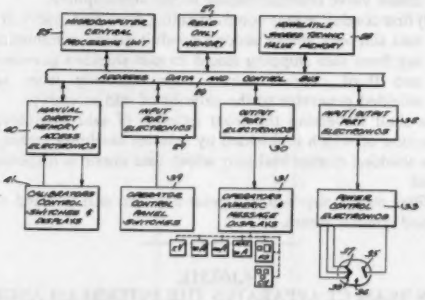
1. An anatomically based programmed diagnostic x-ray

system for conducting diagnostic technics comprising an x-ray tube and power control means coupled with said x-ray tube for controlling its power,

central processor means having input and output means and including memory means for storing data corresponding with parameters including the x-ray tube current (mA), x-ray tube kilovoltage (kV), exposure time (S), current-exposure time product (mAs), use and nonuse of automatic exposure control (AEC), x-ray field area sensor means and x-ray tube focal spot size for various x-ray technics and for storing programs to control said processor means,

automatic exposure control means included in said power control means,

a plurality of manually operable switch means having active and inactive states including technic selector switch means related, respectively, to anatomical areas composing the entire human body and user dominating switch means operable to select kV, mA and mAs independently at the option of the user,



said technic selector switch means being operable, respectively, to active states for selecting programs which determine the parameters for a predetermined priority x-ray technic for the anatomical area related to the technic selector switch means which has been operated and in which technics said AEC means is activated,

means for coupling said switch means to said input means to enable said processor means to scan the states of said switch means, said processor means responding to switch means in active states by executing a program which results in providing output data corresponding with parameters for the selected technic, said x-ray tube power control means being responsive to said output data,

said technics for anatomical areas, which have such x-ray transmissive properties as to be incompatible with use of AEC, being programmed to determine a fixed exposure time for the selected technic and to deactivate said automatic exposure control means simultaneously.

4,160,907

THERMO-OPTICAL FAR INFRARED SYSTEM

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 8, 1978, Ser. No. 875,969
Int. Cl.[2] H01J *31/49*
U.S. Cl. 250—330 **4 Claims**

1. An infrared imaging device including a thin-film thermal-to-optical transducer having an image side and an other side;

means for projecting an infrared image on said image side of said transducer;

a chopper interposed between said means and said transducer;

radiation producing means for projecting a read radiaton on said image side of said transducer;

scanning image detecting means adjacent said transducer on said other side; and

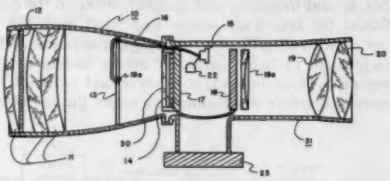


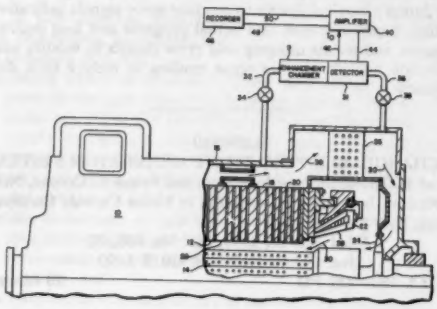
image display means connected to said image detecting means.

4,160,908

PARTICULATE ENHANCEMENT FOR GENERATOR CONDITION MONITORS

D. Colin Phillips, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1978, Ser. No. 873,341
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—381 **11 Claims**



1. An apparatus for detecting submicron particulates in a gaseous carrier, said apparatus comprising;

a particulate enhancement section which includes a platinum surface for said gaseous carrier to flow over whereby the number of submicron particulates in said gaseous carrier increases;

a mixing and gas ionizing section, operably joined to said particulate enhancing section to receive said gaseous carrier and enhanced particulates therefrom, said mixing and gas ionizing section including means defining a delay volume for receiving the particulate bearing gas; and which also includes a source of radiation to effect ionization of the gaseous carrier; and

a detector section operably joined to said mixing and gas ionizing section to receive the ionized gas and entrained particulates therefrom, said detector section including spaced electrodes having an applied voltage and between which current flow occurs by means of the ionized gas to produce a variable signal the magnitude of which is proportional to the amount of entrained particulates.

4,160,909

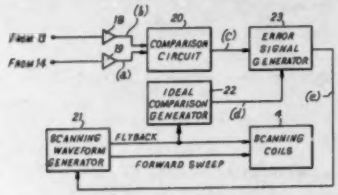
X-RAY TUBE ARRANGEMENTS

Robert J. Froggatt, Southall, England, assignor to E M I Limited, Hayes, England

Filed Jul. 27, 1977, Ser. No. 819,578
Claims priority, application United Kingdom, Aug. 12, 1976, 76 33555
Int. Cl.[2] H05G *1/30*
U.S. Cl. 250—402 **5 Claims**

1. An arrangement for monitoring repetitive movement of a

source of X-radiation along an elongated, X-ray emissive anode/target member, included in an X-ray tube, as a result of repetitive deflection of a beam of electrons, generated in said tubes, to and fro along said member, wherein the deflection is effected by deflection means associated with the tube and supplied with repetitively occurring deflection waveforms, the arrangement including detector means having a plurality of detector devices disposed to receive said radiation through a common aperture dimensioned to cause the radiation to shift



across said devices as said movement occurs, said devices producing electrical output signals indicative of the actual progress of said movement, means for generating datum electrical signals indicative of the desired progress of said movement, means for comparing said electrical output signals with said datum electrical signals to produce error signals indicative of discrepancy between said actual progress and said desired progress, and means utilizing said error signals to modify said deflection waveforms in a sense tending to reduce such discrepancy.

4,160,910

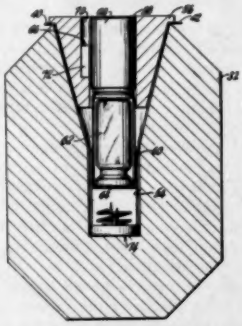
RECHARGEABLE 99MO/99MTC GENERATOR SYSTEM

Alfred K. Thornton, New Hampton, and Frank E. Cerone, New Windsor, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,332

Int. Cl.[2] G01N *21/24;* G01T *1/00*

U.S. Cl. 250—432 PD **10 Claims**



1. A rechargeable, radioisotope, generator system, comprised of, in combination:

(1) a case assembly having contained therein:

(a) a portable shipping shield, comprised of, in combination:

(i) a main shield having an inner chamber communicating to the exterior of said main shield, said chamber having a tapered portion thereof terminating with a greater diameter at the exterior surface of said main shield,

(ii) a closure shield tapered to engage said main shield to provide a radiological safe seal and yet provide conduit means for ingress and egress of liquids, said closure shield having an inner bore traversing its center in alignment with the axis of and about the same diameter of said chamber,

(iii) a plug which is slidably mounted within said inner bore and which can be retained in a fixed position therein by a lip on its upper surface which engages a retaining shelf on at least one portion of said closure shield; said plug being retained in place by removable retaining means which when said plug is disengaged from said shelf it can slidably move through at least a portion of said bore and into said inner chamber,

(iv) a vial for radioisotopes contained within and in alignment with said chamber and having a piercable septum on at least one end thereof, and

(v) conduit and piercing means contained within said chamber for piercing said septum and permitting ingress of eluant from the exterior of said shipping shield and egress of radioisotope from said vial to the exterior of said shipping shield;

(b) a shielded generator having means for absorbing and retaining a parent radioisotope from which a daughter radioisotope can be eluted,

(c) a reservoir of eluant disposed in said assembly and in close proximity to said shielded generator and shipping shield, and having disposed thereon a sterile, one-way-check valve communicating to the atomosphere,

(d) first conduit means communicating from said reservoir to said shipping shield, second conduit means communicating from said shipping shield to said shielded generator, and third conduit means communicating from said shielded generator to the exterior of said assembly;

(2) a shelf traversing the front exterior of said assembly, a portion of which is shielded by exterior shielding means,

(3) a shielded elution vial into which said eluate is dispensed, and

(4) filter means disposed at a point between said vial and said third conduit means.

4,160,911

FAN BEAM CT APPARATUS THE INTERBEAM ANGLE OF WHICH VARIES WITH POSITION ACROSS THE FAN

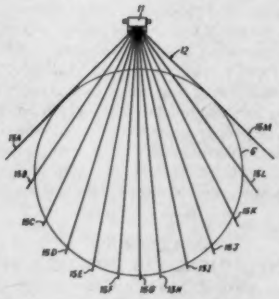
Godfrey N. Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Filed Mar. 17, 1977, Ser. No. 778,578

Claims priority, application United Kingdom, Mar. 18, 1976, 11026/76

Int. Cl.[2] A61B *6/02*

U.S. Cl. 250—445 T **5 Claims**



1. Computerised tomographic apparatus including a source of a fan-shaped distribution of penetrating radiation, such as X-radiation, support means supporting said source so that said radiation propagates across a location at which a desired cross-sectional slice of a patient's body can be disposed, detector means, including a plurality of detector devices, supported by said support means and disposed to receive radiation, propagated along respective beams within said distribution after it has traversed said location, scanning means for causing said support means, and with it said source and said detector means, to move angularly around said location causing, on the one

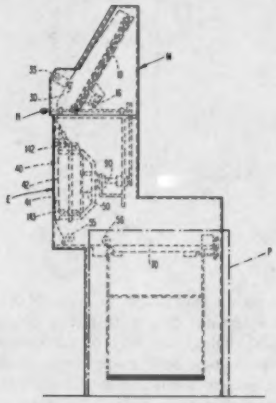
hand, said source to irradiate said location from a plurality of angularly spaced positions therearound and, on the other hand, the detector means to receive radiation traversing said location from each of said positions, and wherein the angle between adjacent ones of said beams varies across said distribution to cause substantially uniform spacing of beams which are substantially parallel to each other.

4,160,912

AUTOMATIC CHEST X-RAY MACHINE

William J. Hogan, Medco Company, P.O. Box 236, Bally, Berks County, Pa. 19503

Filed Nov. 9, 1977, Ser. No. 849,939
Int. Cl.[2] G11B *1/00*
U.S. Cl. 250—468 **12 Claims**



1. A chest X-ray machine having supporting frame members and also comprising:

a. a film-exposure station, said station including a vertically-disposed film-receiving holder having a pocket closed at its lower edge and opened at its top, said holder having a vertically-disposed front X-ray-transmissive plate and a vertically-disposed rear movable pressure plate;

b. a film guide chute above the open top of said holder;

c. a magazine located above the film-exposure station having a tray for containing a supply of cut-sheet unexposed film, said magazine being inclined relative to the vertical;

d. means, including vacuum cup means, for lifting a topmost sheet of film from the film supply by an upward sliding motion and for carrying it to a position above said guide chute such that upon release of suction the released film sheet will drop through said guide chute into the pocket of said holder;

e. means for moving said rearward pressure plate forwardly against the film sheet in said holder pocket, said moving means moving the lower part of said pressure plate forwardly against the lower part of said film sheet before the upper part of said pressure plate is moved forwardly against the upper part of said film sheet, thereby to force air upwardly out of said holder pocket;

f. a horizontally-disposed stub pivot shaft journalled in at least one of the frame members and located on the center axis of, and rearward of, said exposure station;

g. support means mounting said exposure station vertically on said stub shaft for angular movement therewith;

h. means for opening the closed bottom of said film holder pocket; and

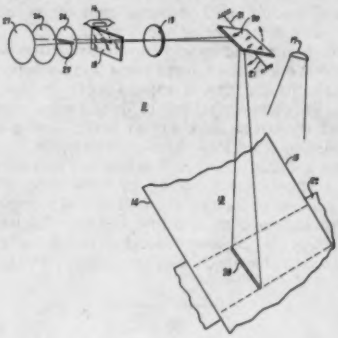
i. film transport means for transporting a film sheet which drops through the open bottom of said holder pocket at said exposure station toward film processor means.

4,160,913

WEB SCANNING APPARATUS

Irving R. Brenholdt, Stratford, Conn., assignor to St. Regis Paper Company, New York, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,064
Int. Cl.[2] G01N *21/32*
U.S. Cl. 250—563 **16 Claims**



1. A web scanning apparatus for a web movable along a path, comprising, in combination,

a radiation detector,

scanning means to establish a flying spot scanning path to periodically scan transversely of the moving web from a point preceding one side of the web and across the web to a point beyond the other side of the web to thus also scan a dark background on either side of the web,

means to irradiate at least the flying spot scanned portion of the web,

means to transmit to said detector the image of the flying spot scanned portion of the web,

a differentiator connected to differentiate the output of said detector, and

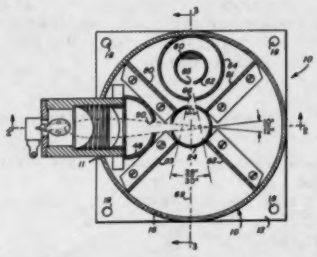
an output characterization circuit connected to the output of said differentiator to characterize between increasing and decreasing signals relative to a normal output from said detector during scan of the web signalling a wrinkle and a hole, respectively, in the web.

4,160,914

APPARATUS FOR MEASURING OF PARTICULATE SCATTERING IN FLUIDS

William H. Wynn, Hillsborough, Calif., assignor to Monitek, Inc., Redwood City, Calif.

Filed Dec. 16, 1977, Ser. No. 861,218
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—574 **17 Claims**



1. An optical apparatus for the measurement of light scattered by a particulate within a fluid in the direction of a scattering axis, comprising:

a housing;

a tubular enclosure confining the fluid with the particulate, having at least an optically transparent portion, disposed in said housing;

a light source for emitting light in the direction of an illumination axis into said housing and through said optically transparent portion;

a light sensitive detector having an active area which is disposed within said housing at right angles to and centrally with the scattering axis;

a first battle surrounding said detector, said first baffle having a first aperture centered about said scattering axis;

a second baffle, identical in shape to but larger than said first baffle, surrounding said first baffle and being equidistantly spaced therefrom, said second baffle having a second aperture centered about said scattering axis;

the shape and size of said first and second apertures and the lateral extent of said active area being selected so that a line generatrix touching the wall of said second aperture and passing through said first aperture and intersecting said active area generates a solid surface defining a predetermined solid angle of acceptance within which light will reach said detector.

4,160,915

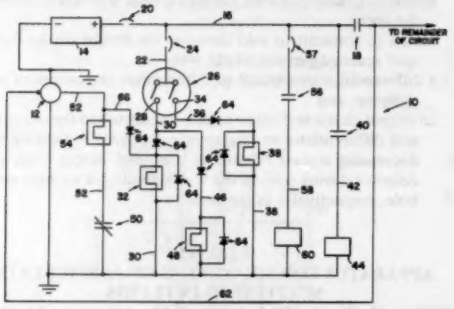
Patent Not Issued For This Number

4,160,916

ENGINE STOP-START ELECTRICAL CIRCUIT

Stamos I. Papasideris, Bristol, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 12, 1977, Ser. No. 832,252
Int. Cl.[2] H02G *3/00*
U.S. Cl. 307—10 R **9 Claims**



1. An electrical circuit for controlling an engine, comprising:

(a) electrical power source means for starting and turning off the engine;

(b) an engine shut-off solenoid being energizable only after turning off the engine; and

(c) means for generating current on start-up of the engine and after turning off the engine and for energizing said shut-off solenoid with said current that is generated after the turning off the engine.

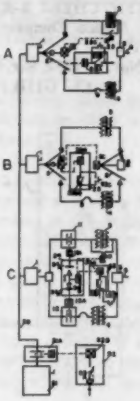
4,160,917

ENERGY CONSERVING TRANSFORMER POWER SUPPLY SYSTEM

Herman Wald, 97-11 Horace Harding Expressway, Queens, N.Y. 11368

Filed Jan. 4, 1978, Ser. No. 866,935
Int. Cl.[2] H02J *9/06*
U.S. Cl. 307—64 **9 Claims**

1. An energy conserving transformer power supply system having a plurality of power transformer groups at various remote locations, a common power feeder, a common power switching means, a master program timer switching means, said common power feeder supplying said power transformer groups, said master program timer switching means operatively connected to said power switching means controlling the power flow through said common power feeder, each of said transformer groups comprising: a main transformer of large capacity, an auxiliary transformer of relatively small capacity, a common load, a transfer switching means, a relay control means, said transfer switching means adapted to alternately transfer power to said common load through said main transformer or said auxiliary transformer, each of said relay control means operatively connected to said common feeder,



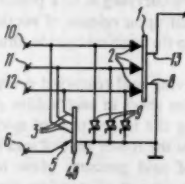
said relay control means adapted to control the alternate operation of said transfer switching means in accordance with predetermined timing schedules of the occupancy and non-occupancy periods of said master program timer switching means being in operational relationship with each of said relay control means, thereby to fully de-energize said main transformer of each said transformer groups during said non-occupancy periods.

4,160,918

INTEGRATED LOGIC CIRCUIT

Artashes R. Nazarian, ploschad Junosti, 3, kv. 16; Vyacheslav Y. Kremlev, korpus 423, kv. 81; Vilyam N. Kokin, korpus 441, kv. 115, and Nikolai M. Manzha, korpus 401, kv. 49, all of Moscow, U.S.S.R.

Filed Dec. 29, 1977, Ser. No. 865,362
Claims priority, application U.S.S.R., Jan. 6, 1977, 2438345
Int. Cl.[2] H03K *19/08, 19/12, 19/34*
U.S. Cl. 307—205 **8 Claims**



1. An integrated injection logic circuit comprising:

a switching element having a unipolar FET with a plurality of gates, a source and a drain, said gates serving as inputs of said logic circuit and said drain serving as an output of said circuit;

a load transistor having a plurality of collectors, an emitter and a base area, said transistor having its collectors connected to respective gates of said unipolar FET and said base area combined with said source of said unipolar FET and grounded;

a power supply connected to said emitter of said load transistor;

a plurality of double-pole gating elements connected to said gates of said unipolar FET and to said base area of said load transistor, the conduction voltage of said gating elements being lower than that across p-n junctions of respective gates of said unipolar FET.

4,160,919

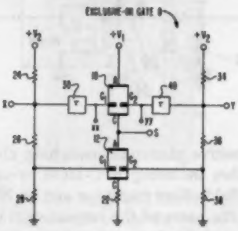
EXCLUSIVE-OR CIRCUIT

Walter R. Curtice, West Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,482

Int. Cl.[2] H03K *19/32, 19/08*

U.S. Cl. 307—216 **4 Claims**



1. A circuit having first and second input terminals, each adapted to receive a stream of logic 1 signals and logic 0 signals, comprising:

a first transferred electron logic device (TELD), having first and second Schottky-barrier gates equidistant from the anode thereof, said anode adapted to connection to a positive terminal of a bias voltage source;

a second TELD having first and second Schottky-barrier gates equidistant from the anode thereof, said anode thereof being connected at an output junction to the cathode of said first device, the cathode of said second device being adapted to connection to the negative terminal of said bias voltage source;

delay means connected to said input terminals for respectively coupling said signals from said first and second input terminals to said gates of said first device, said first device forming a domain in response to one of said signals being a logic 1, thereby causing a logic 1 signal to be provided at said output junction; and

divider means connected to said input terminals and said gates of said second device for respectively coupling a fraction of said input signals from said first and second input terminals to said gates of said second device, said second device forming a domain in response to both of said second signals being a logic 1, whereby a signal representative of a logic 0 is provided at said output junction.

4,160,920

BISTABLE ELEMENT AND A SWITCH CIRCUIT COMPRISING SUCH A BISTABLE ELEMENT

Henri Courier de Méré, Paris, France, assignor to Bicosa Societe de Recherches, France

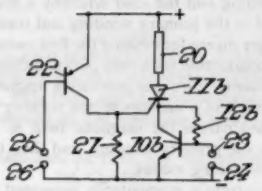
Filed Jul. 15, 1977, Ser. No. 816,256

Claims priority, application France, Jul. 21, 1976, 76 22294

Int. Cl.[2] H03K *17/72*

U.S. Cl. 307—252 C **8 Claims**

1. A bistable device having a first state control input and a second state control input and exhibiting a first stable state of conductivity after a pulse has been applied to its first state control input, and exhibiting a second state of conductivity, different from the first, after a pulse has been applied to its second state control input, said device comprising: an element of the thristor type having anode, cathode and gate electrodes and an element of the transistor type having emitter, collector and base electrodes; a first control input connected to said gate electrode of the thyristor type element for determining a first stable state of conductivity of the device; a second control input connected to said base electrode of the transistor type element for determining a second stable state of conductivity, different from the first, of the device; said first and second control inputs comprising on and off control inputs of the device and each comprising a first conducting contact, a second conducting contact associated with said first conducting contact, and means connecting the second contacts to a predetermined potential point; means connecting the emitter-collector path of said transistor type element in relation to the anode-cathode path of said thyristor type element so that one of the two stable conductivity states of said transistor type element causes the intensity of current flowing through said thyristor type element to be cancelled, said second stable state of conductivity corresponding to the disabled state of said thyristor type element; and an amplifier element connected between said first control input and said gate electrode of said thyristor type element.



4,160,921

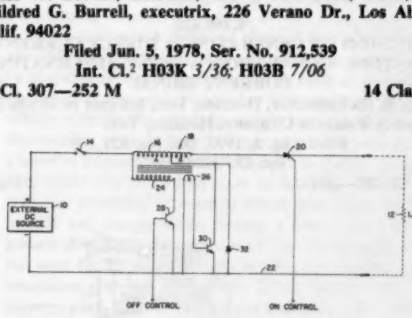
THYRISTOR CONTROL

Charles W. Burrell, deceased, late of Los Altos, Calif., by Mildred G. Burrell, executrix, 226 Verano Dr., Los Altos, Calif. 94022

Filed Jun. 5, 1978, Ser. No. 912,539

Int. Cl.[2] H03K *3/36;* **H03B** *7/06*

U.S. Cl. 307—252 M **14 Claims**



4. A control circuit for interrupting the supply of direct current (D.C.) power from an external source to a load, the control circuit comprising

a common lead;

a reverse blocking triode thyristor having separate anode, cathode and gate leads;

a transformer having a saturable core, a tapped primary winding, a first secondary winding and a second secondary winding, the first secondary winding being wound in opposition to the primary winding;

first switching means;

electronic, second switching means having a pair of switching terminals and a control terminal; and wherein

the D.C. power supply, the primary winding, the thyristor, the load, and the common lead are connected together in series;

the first secondary winding is connected in series with the

first switching means between the common lead and the D.C. power supply;

the second secondary winding is connected between the common lead and the control terminal of the second switching means;

one of the switching contacts of the second switching means is connected to the common lead and the other is connected to the tap of the transformer's primary winding;

gate trigger means for applying a gate signal to the thyristor gate lead to cause the thyristor to become conductive and thereby cause electrical current to flow through the primary winding and the load whereby a magnetic field is generated in the primary winding and transformer core;

switch trigger means for causing the first switching means to become conductive for a time period sufficient to saturate the transformer core and generate a magnetic field in the core which is of a magnitude and polarity to enable it to oppose and cancel the magnetic field in the core, produced by the primary winding, and then to open circuit the first switching means;

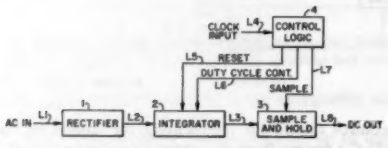
whereby a current is momentarily generated in the primary winding which opposes and cancels the current produced therein by the D.C. power supply and a voltage is also generated in the second secondary winding which biases the second switching means to become conductive and shunt the primary winding tap to the common lead, to sustain this condition and to hold the potential of the anode of the thyristor below the negative potential of the D.C. supply so that the thyristor is positively turned off.

4,160,922

METHOD OF GENERATING A DIRECT CURRENT CONTROL SIGNAL FROM A NOISY ALTERNATING CURRENT SIGNAL

James E. Rickenbacker, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Aug. 2, 1977, Ser. No. 821,120
Int. Cl.[2] H03K *5/00*
U.S. Cl. 307—261 **2 Claims**



1. Apparatus for generating a direct current output signal proportional to the amplitude of an alternating current signal comprising:

a rectifier, said rectifier being responsive to said alternating current signal for generating a rectified output signal related to said alternating current signal;

integrator means for integrating the rectified output signal from said rectifier for a selected number of half cycles of said alternating current signal, said integrator means including means responsive to a variable control signal for varying the integrating time constant of said integrator means; and

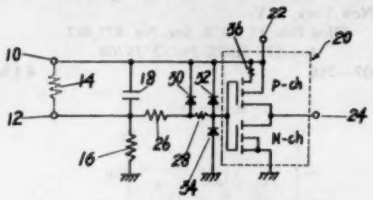
means for sampling the output level of said integrator means and for holding the sampled output level for a selected time.

4,160,923

TOUCH SENSITIVE ELECTRONIC SWITCHING CIRCUIT FOR ELECTRONIC WRISTWATCHES

Hidetoshi Maeda, and Toshihiro Ohba, both of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 655,213, Feb. 4, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,087
Claims priority, application Japan, Feb. 5, 1975, 50-15727
Int. Cl.[2] H03K *3/353;* **H02H** *9/04;* **G04B** *19/00;* **H03K** *17/60*
U.S. Cl. 307—308 **4 Claims**



1. A touch sensitive electronic switching circuit for electronic wristwatches including a C-MOS inverter having a P-channel MOS field effect transistor and an N-channel field effect transistor, the gates of the respective transistors being coupled together and the drains of said transistors being coupled together, first and second input terminals for said C-MOS inverter across which an operator's body completes an electrical circuit to initiate switching of said C-MOS inverter from one state to another, a bias voltage source of a first level coupled to the source electrode of said P-channel transistor, a bias voltage source of a second level coupled to the source electrode of said N-channel transistor, said first level being higher than said second level, a pull-down resistor connecting said second input terminal with said bias voltage source of said second level, means connecting said first input terminal to said bias voltage source of said first level, and means connecting said second input terminal to a common gate terminal of the P and N channels of the C-MOS inverter, the improvement comprising:

resistor means of a high resistive value connected between said bias voltage source of said first level and the source electrode of said P-channel transistor, the ratio of the resistance of said resistor means to the resistance of said pull-down resistor being within a predetermined range.

4,160,924

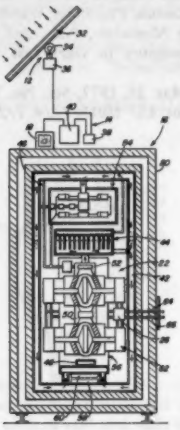
CRYOGENIC TEMPERATURE OPERATED MAGNETIC RECIPROCATING MOTOR SYSTEM

Elton M. Botts, Mattoon, Ill., assignor to Energy 76, Inc., Mattoon, Ill.

Filed Jul. 7, 1977, Ser. No. 813,761
Int. Cl.[2] H02K *33/00*
U.S. Cl. 310—17 **9 Claims**

1. In combination with a source of cryogenic cooling medium and a source of electrical energy, a power generating plant incorporating at least one converter means, said converter means including an insulated housing enclosing an elongated motor chamber, a pair of axially spaced electromagnetic coil assemblies mounted within the chamber and substantially extending across approximately its ends, an armature movably mounted within the housing chamber between the coil assemblies and disposed for reciprocal movement therebetween, means connected to said source of electrical energy for controlling the supply and polarity of the electrical energy conducted to the coil assemblies to effect the said movement of the armature, a power shaft connected to the said armature and disposed for sealed extension through the said coil assemblies

and housing and out of the chamber, and insulated conduit means connecting with the housing for simultaneously con-



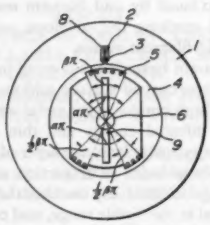
ducting said electrical energy and the cryogenic cooling material to the coil assemblies within the motor chamber.

4,160,925

QUADRUPLE FREQUENCY CONVERTER

Fujio Ishikawa, Yokohama, Japan, assignor to Toyo Denki Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1977, Ser. No. 820,458
Claims priority, application Japan, Aug. 18, 1976, 51-97794
Int. Cl.[2] H02K *47/18*
U.S. Cl. 310—160 4 Claims



1. A frequency converter of a synchronous rotating machine type, comprising:

(a) a stator having a polyphase primary winding and a polyphase secondary winding, said primary winding and said secondary winding having a number of poles in the ration of 1 to 4; and

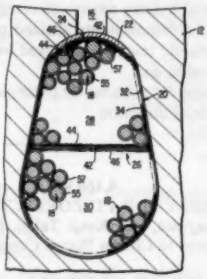
(b) a freely rotating rotor having a number of salient poles which is the same number as said poles of said primary winding, said salient poles each having center and outer portions and being divided into first and second groups, in which one salient pole of said first group has a center portion providing a narrower air gap between said rotor and said stator than said outer portions of said one salient pole and another salient pole of said second group has a center portion providing a wider air gap between said rotor and said stator than said outer portions of said another salient pole, said rotor further including small poles of said first group which are narrower in width than said one salient pole and located within $\pm\pi 2$ from the center of said one salient pole, whereby said primary winding is cnnectable to an ac source to operate the converter as a synchronous motor and power output machine of quadruple frequency of the source frequency, the quadruple frequency power being derived from said secondary winding.

4,160,926

MATERIALS AND IMPREGNATING COMPOSITIONS FOR INSULATING ELECTRIC MACHINES

Lloyd S. Cope, Villa Park, and Ladislav J. Rejda, Arcadia, both of Calif., assignors to The Epoxylite Corporation, Anaheim, Calif.

Filed Jun. 20, 1975, Ser. No. 588,847
Int. Cl.[2] H02K *3/36*
U.S. Cl. 310—215 18 Claims



1. A random wound electric machine having a stator impregnated with a cured impregnating material comprising:

(a) a plurality of slots contained in said stator, each slot having a wall which defines a channel into which electrical coils are inserted through an opening in the stator;

(b) a plurality of windings contained in each of said slots;

(c) a layer of material disposed within each of the slots which encircles the windings within each slot and bridges the opening of each slot, the layer of material comprising a layer of insulative material disposed in contact with the wall of the slot and a first layer of fabric in contact with the layer of insulative material which is wettable, impregnatable and compressible, having a free surface energy greater than the surface tension of the impregnating material used for its impregnation and having capillary sized interstices disposed within the fabric which retain the impregnating material to produce a substantially void free fill of impregnating material between the fabric and the windings, the fabric being compressed by contact with the windings to substantially fill voids disposed between the wall and the windings with the fabric;

(d) the layer of material disposed within each of the slots comprising a slot liner and a reinforcing layer which bridges the opening in the stator for each slot, the slot liner and reinforcing layer each including the first fabric layer compressed by the windings, the reinforcing layer also including a second fabric layer compressed by contact with the first fabric layer of the slot liner, and having capillary sized interstices which retain the impregnating material to produce a substantially void free fill of impregnating material between reinforcing material and the windings; and

(e) the fabric layer being wetted by the impregnating material prior to curing and impregnated with cured impregnating material by retention of the impregnating material within the capillary sized interstices.

4,160,927

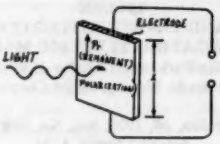
FERROELECTRIC CERAMIC DEVICES

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 533,365, Dec. 16, 1974, Pat. No. 4,051,465, which is a continuation-in-part of Ser. No. 411,853, Nov. 1, 1973, Pat. No. 3,855,004. This application Apr. 5, 1977, Ser. No. 784,761

Int. Cl.[2] G21D 7/00

U.S. Cl. 310—302 2 Claims



1. An electrical battery apparatus comprising,
a substrate of a radioactively ionized polycrystalline ferroelectric ceramic material disposed between two conductive electrodes, and
electrical means for remanently polarizing said substrate in a predetermined direction.

4,160,928

CASE ASSEMBLY FOR PIEZOELECTRIC RESONATOR

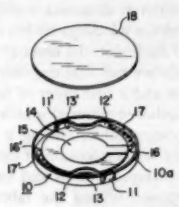
Toshihiko Nakayama, and Kenji Takei, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Continuation of Ser. No. 685,257, May 11, 1976, which is a continuation of Ser. No. 523,924, Nov. 14, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,140

Claims priority, application Japan, Nov. 20, 1973, 48-130515

Int. Cl.[2] H01L 41/10

U.S. Cl. 310—353 6 Claims



1. An oscillator case assembly comprising a thickness shear oscillator element having two surfaces, an energizing electrode attached onto each surface of the oscillator element and fine electrical lead means having members connected electrically at ends of each of said electrodes for energizing said electrodes, said case assembly further comprising a case element shaped into a shell and made of a solid insulating material, preferably glass or ceramic material, a pair of thin layer conductive elements, each extending from an inside surface through a peripheral surface to an outer surface of said case element and serving as part of lead-in or lead-out means for energizing said electrodes, and a pair of conductive retainer members arranged in diametrically opposite arrangement to each other, each retainer member being formed from a rectangular metal strip and having a shaped portion adapted for receiving and supporting a portion of the periphery of said oscillator element, each of said retainer members being electrically connected between one of said members of said lead means and one of said pair of conductive elements.

4,160,929

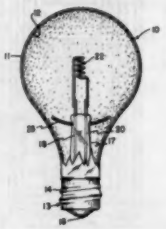
INCANDESCENT LIGHT SOURCE WITH TRANSPARENT HEAT MIRROR

Luke Thorington, Easton, Pa.; Peter Walsh, Stirling, N.J.; Ronald Koo, Upper Montclair, N.J., and Wolfgang Thouret, Verona, N.J., assignors to Duro-Test Corporation, North Bergen, N.J.

Filed Mar. 25, 1977, Ser. No. 781,355

Int. Cl.[2] H01K 1/14, 1/32

U.S. Cl. 313—112 33 Claims



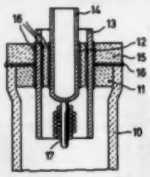
1. An incandescent electric lamp comprising:
an envelope,
incandescent filament means within said envelope for producing upon incandescence energy in the visible and infrared range upon the application of electrical current thereto,
means electrically connected to said filament means adapted for supplying electrical current thereto,
said filament means being located with respect to the interior of the envelope and the major portion of said envelope being shaped with a curved surface such that infrared energy produced by said filament means upon incandescence and reaching the envelope can be reflected back toward said filament means,
and a transparent heat mirror coating on a major portion of said envelope curved surface said envelope formed by a layer of a high conductivity metal which is thick enough to reflect infrared energy and thin enough to transmit visible energy and at least one layer of a dielectric material thereon whose index of refraction of the energy in the visible range substantially matches the index of absorption of the metal in the visible range, said coating for reflecting back towards the filament at least an average in excess of about 60% of the energy over the infrared range produced by said filament means and for transmitting therethrough an average in excess of about 60% of the energy over the visible range produced by said filament means which reaches said coating said dielectric material providing phase matching to the visible energy for the metal.

29. An incandescent electric lamp comprising
a spherical shaped envelope with an elongated neck portion,
an incandescent filament within said envelope for producing upon incandescence energy in the visible and infrared range upon application of electrical current thereto,
means electrically connected to said filament adapted for supplying electrical current thereto,
a coating on the spherical portion of the envelope for reflecting back to the filament at least a part of the infrared energy produced by said filament and for transmitting therethrough a substantial portion of the visible range energy produced by said filament,
said reflector means adjacent said neck portion having substantially the same radius of curvature as the spherical portion of said envelope and located with respect to said envelope spherical portion to conform to its contour.

4,160,930
ELECTRIC DISCHARGE LAMP WITH ANNULAR CURRENT CONDUCTOR

Antonius J. G. C. Driessen, and Hendricus E. M. C. Vos, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 16, 1976, Ser. No. 723,743
Claims priority, application Netherlands, Sep. 29, 1975, 7511415
Int. Cl.[2] H01J *17/04, 61/06*
U.S. Cl. 313—217 1 Claim

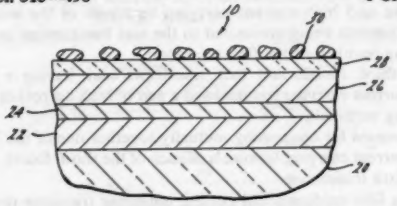


1. An electric discharge lamp which comprises a cylindrical ceramic lamp vessel provided with end seals which mainly consist of ceramic, each of said end seals including a cylindrical current leadthrough for a main electrode and, in at least one of the seals, a current leadthrough for an auxiliary electrode, said current leadthrough for the auxiliary electrode being a cylindrical tube which surrounds the current leadthrough for the main electrode concentrically and is separated therefrom by a ceramic ring, said cylindrical tube which forms the current leadthrough of the auxiliary electrode projecting at least 2 mms into said lamp vessel, said main electrode having a tip which extends axially further into said lamp vessel than said auxiliary electrode disposed in the same end of said lamp vessel, said cylindrical tube consisting of a material selected from the group consisting of tungsten, molybdenum, rhenium and alloys thereof.

4,160,931
SOLID STATE SOURCE OF RADIANT ENERGY HAVING A CONTROLLABLE FREQUENCY SPECTRA CHARACTERISTIC

John J. Lambe, Birmingham, and Shaun L. McCarthy, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 836,624, Sep. 26, 1977. This application Apr. 14, 1978, Ser. No. 896,408
Int. Cl.[2] H01L *33/00;* H05B *33/02*
U.S. Cl. 313—498 6 Claims

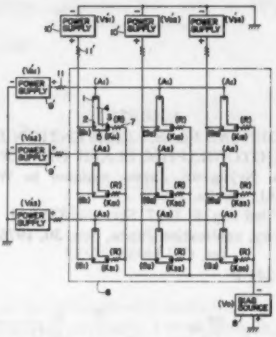


1. An improved solid state source of visible radiant energy comprising:
- a first electrode element;
- an insulating layer overlying said first electrode element; and
- a counter-electrode overlying said insulating layer to form a tunnel junction which generates surface plasmon modes in response to voltage applied between said first electrode and said counter-electrode;
- wherein said improvement includes means external to said junction for providing optical output coupling of said surface plasmon modes in a visible light spectra having a high frequency cutoff $\nu_{co}=|eV|/h$, wherein h is the Planck constant, e is the electron charge and V is the value of the applied voltage.

4,160,932
METHOD OF DRIVING FLAT DISCHARGE PANEL

Shigeo Mikoshiba, Tokyo, and Shinichi Shinada, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 8, 1977, Ser. No. 785,849
Claims priority, application Japan, Apr. 9, 1976, 51-39350
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169.4 8 Claims



1. A method of driving a flat discharge panel disposed in matrix type,

said matrix composing:

a plurality of first electrodes,

said first electrodes being laterally disposed and commonly connected in each lateral line,

a plurality of second electrodes,

said second electrode being longitudinally disposed and commonly connected in each longitudinal line,

a plurality of third electrodes,

said respective third electrodes forming a plurality of first discharge spaces together with said respective first electrodes and forming a plurality of second discharge spaces together with said respective second electrodes, and said respective second discharge spaces being formed in common as part of said respective first discharge spaces,

resistors connected in series with said respective third electrodes,

said third electrodes commonly connected all via said resistors,

discharging gas filled in said first and second discharge spaces,

said method comprising the steps of:

applying predetermined applied voltages V_A and V_S for the first and second discharge spaces in advance between said first and third electrodes, and between said second and third electrodes, respectively, where said voltages V_A and V_S satisfy the relation,

$$V_A < V_A(\text{on}) = V_S + (V_{Abd} - V_{Sm})$$

where

$V_A(\text{on})$ is the applied voltage for the first discharge required for shifting the discharge from the second to the first discharge spaces,

V_{Abd} is the first break down voltage when the second discharge space is discharged, and

V_{Sm} is the second discharge maintenance voltage establishing self-supporting discharge in either of the first and second discharge spaces,

varying at least one of V_A and V_S so that the values of said

V_A and V_S of the electrodes of the discharge spaces to be selected and presenting the self-supporting discharge in the second discharge space satisfies $V_A > V_A(on)$,

varying at least one of said V_A and V_S so that the values of said V_A and V_S between the electrodes in half-selection mode satisfy,

$$V_A < V_A(on)$$

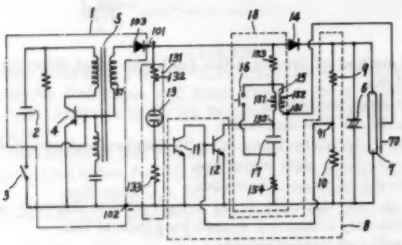
thereby shifting or maintaining the self-supporting discharge in the first and second discharge spaces in the discharge spaces to be selected.

4,160,933

ACCIDENTAL FLASH PREVENTION IN A PHOTOGRAPHIC FLASH DEVICE

Kazuo Tanaka, Neyagawa, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,525
Claims priority, application Japan, Sep. 30, 1976, 51-118132
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—241 P **13 Claims**



1. A photographic flash device comprising:

a flash discharge tube having discharging and triggering electrodes,

a main capacitor connected across discharging electrodes of said flash discharge tube,

triggering circuit means including a triggering capacitor connected with a synchronous switch and a triggering transformer for providing a triggering pulse to said triggering electrode for flashing said flash discharge tube upon closing said switch,

a voltage indicator for indicating the reaching of a specified level of the voltage of said main capacitor,

a DC power source having a power switch for feeding to said indicator and main capacitor in that order a high voltage DC current when said power switch is closed,

backward current preventing means connected between one end of said main capacitor and one end of said voltage indicator for allowing said DC current to flow forwardly from said source to said main capacitor while said power switch is closed and for preventing discharge current of said main capacitor from flowing backwardly from said main capacitor to said voltage indicator while said power switch is closed or open, and

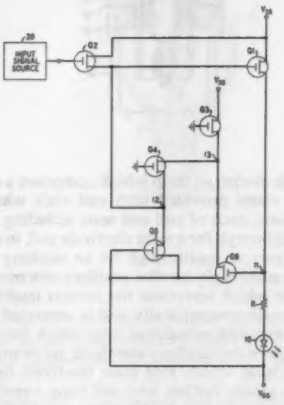
a safety circuit having a switching means with a control terminal which is connected to said voltage indicator for controlling the charge and discharge of said triggering capacitor respectively when the indicator indicates and stops indication of said specified voltage level.

4,160,934

CURRENT CONTROL CIRCUIT FOR LIGHT EMITTING DIODE

Howard C. Kirsch, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 11, 1977, Ser. No. 823,729
Int. Cl.[2] G05F *1/56*; H05B *43/00*
U.S. Cl. 315—307 **12 Claims**



7. Semiconductor apparatus comprising:

(a) a first transistor having a low current carrying terminal and a pair of high current carrying terminals, one of said high current carrying terminals being connected to an output terminal to which is connected a light emitting diode in series with a ballast resistor;

(b) a second transistor having a low current carrying terminal for connection thereto of an input signal source and having a pair of high current carrying terminals, one of the said high current carrying terminals of the second transistor being connected to the said low current carrying terminal of the first transistor;

(c) third, fourth, and sixth transistors each having a low current carrying terminal and a pair of high current carrying terminals;

(d) means for connecting mutually together one of the high current carrying terminals of each of the third, fourth, and sixth transistors;

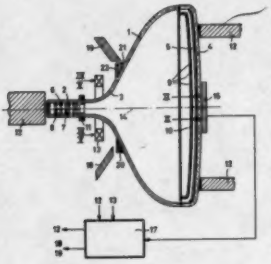
(e) a fifth unidirectional current inhibiting transistor device connected between the other high current carrying terminals of the fourth and sixth transistors; and

(f) means for connecting the said other high current carrying terminal of the fourth transistor to said one of the high current carrying terminals of the second transistor; said first, second, third, fourth, fifth, and sixth transistors being MOS transistors characterized in that the transconductance of the fifth transistor is less than that of the third transistor, the trnasconductance of the third transistor is less than those of both the fourth and the sixth transistors, and the transconductances of both the fourth and sixth transistors are less than that of the second transistor.

4,160,935
METHOD AND APPARATUS FOR PROVIDING REFERENCE POINTS FOR MOUNTING THE MAGNETIC DEFLECTION UNIT OF A COLOR DISPLAY TUBE

Theodorus C. Groot; Pieter Huijer, and Johannes G. van Lent, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,334
Claims priority, application Netherlands, Sep. 17, 1976, 7610353
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—370 9 Claims

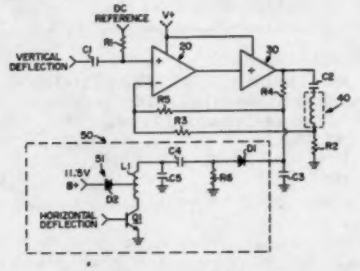


5. A method of determining the position of the axis of an electron beam in a display tube having an envelope, an electron gun for generating the electron beam and a display screen located in the path of the beam, said method comprising the steps of energizing said gun to thereby generate said electron beam, producing, in the path of the beam, a dynamic multipole magnetic field in a plane normal to the longitudinal axis of said tube, moving one of said tube and the field relative to the other until said beam produces a dot on said screen, and locating the position of said dot with respect to the center of said field to thereby determine the position of the beam axis which is coincident with a line passing through the center of said field and said dot.

4,160,936
FAST-START VERTICAL CURRENT FEEDBACK CIRCUIT

Tex K. Monroe, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamfored, Conn.

Filed Dec. 14, 1977, Ser. No. 860,148
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—388 8 Claims



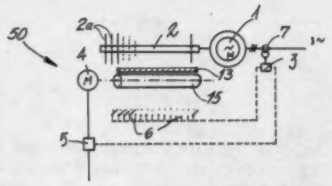
1. In a vertical deflection amplifier including a preamplifier having an input at which is applied a substantially DC feedback signal for the stabilization of the amplifier's DC output, the feedback signal being derived fom the amplifier's output and applied to the input from a sampling network characterized by a time-constant substantially longer than the period of the amplifier's AC input signal, the improvement comprising:

a fast-start circuit for superimposing a transient voltage on the feedback signal so that the DC output of the amplifier reaches a predetermined quiescent level within a length of time substantially shorter than the sampling network time-constant.

4,160,937
PROCESS FOR THE CONTROL OF THE FORWARD SPEED OF WORK-PIECES

Antonio Fiorini, Via Olive, 33, Montorio Veronese, Verona, Italy

Filed Jul. 15, 1977, Ser. No. 816,176
Claims priority, application Italy, Aug. 25, 1976, 26515 A/76
Int. Cl.[2] B23Q *5/10, 5/28*
U.S. Cl. 318—39 11 Claims

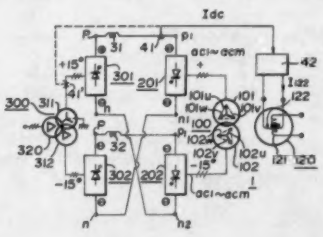


1. A method for automatically controlling the feed speed of a motor comprising, advancing a work-piece in a feed path at a feed speed, providing a tooling device having a tool member movable in the feed path with a portion engageable with a work-piece for tooling the work-piece and for receiving a negative load from the advancing work-piece which is proportional to the size of the portion of the tool member engaged with the work-piece, sensing the size of the portion of the tool member engageable with the work piece which corresponds with a maximum load admissible on the tooling device, and reducing the feed speed of the work-piece in the feed path when the maximum load determined by the sensing of the portion of the tool member engaged with the work-piece is exceeded.

4,160,938
MOTOR DRIVE APPARATUS

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1977, Ser. No. 831,650
Claims priority, application Japan, Sep. 29, 1976, 51-117508
Int. Cl.[2] H02P *5/28*
U.S. Cl. 318—82 8 Claims



1. A motor drive apparatus comprising:

an AC motor having G groups ($G \geqq 2$) of m-phase AC windings of which each group includes m-phase AC windings with a number M of AC input terminals ($M \geqq 2$);

G groups of m-phase inverter units of which each unit has a plurality of solid-state switch elements, a pair of DC input

terminals and a number M of AC output terminals respectively connected to the M AC input terminals of each group of the G groups of m-phase AC windings; and each of the solid-state switch elements is connected between one of the DC input terminals and each of the AC output terminals;

G groups of DC power sources of which each group has a pair of DC output terminals;

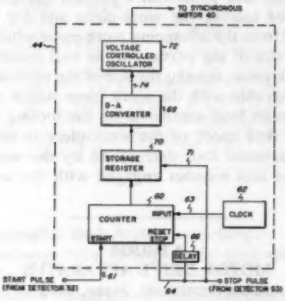
a closed loop of DC line connecting the pairs of the DC output terminals of the G groups of DC power sources and the pairs of the DC input terminals of the G groups of m-phase inverter units with the DC power sources and the inverter units being alternately arranged in the connection.

4,160,939

MOTOR SPEED CONTROL SYSTEM

David E. Damouth, Rochester, N.Y., and William F. Gunning, Los Altos Hills, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1977, Ser. No. 832,776
Int. Cl.[2] H02P 5/34
U.S. Cl. 318—723 **10 Claims**



1. In an apparatus having a motor driven rotating multifaceted polygon for scanning a beam of radiation across a medium in successive scans, a motor speed control system comprising:

scan signal means for generating a start of scan signal for each facet;

a counter having the capability of being started and stopped by signals applied thereto;

a clock coupled to said counter for supplying pulses to be counted thereby, said start of scan signal starting said counter;

means for stopping said counter, the number of counts in said stopped counter representating the speed of said multifaceted polygon, the output count being in digital format;

means for converting said digital format signal to an analog signal; and

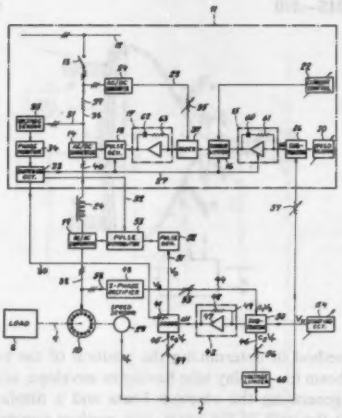
a voltage controlled oscillator having a nominal frequency output which corresponds to the desired polygon speed, the frequency of said voltage controlled oscillator being changed in response to said analog signal if the actual speed of said polygon is different than said nominal speed, and means for coupling the output of said voltage controlled oscillator to said motor.

4,160,940

METHOD OF AND SYSTEM FOR OPERATING AN INDUCTION MOTOR

Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 838,942
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1976, 2644748
Int. Cl.[2] H02P 5/34
U.S. Cl. 318—803 **13 Claims**



1. A method of operating an induction motor having a stator with multiple phase windings and a rotor coupled with a load, comprising the steps of:

energizing said phase windings with a polyphase input current of variable frequency to generate a rotating stator field entraining said rotor with a slip frequency depending on the load and on the magnitude of said input current;

maintaining the rotor speed substantially at a selected level by making compensatory adjustments in said magnitude upon deviations of said speed from said level, said compensatory adjustments taking effect with an inherent time lag;

continuously monitoring a stator voltage developed across said phase windings; and

automatically varying the frequency of said input current, in response to changes of said stator voltage due to variations in said slip frequency, in a sense temporarily counteracting such variations within said time lag and at a rate substantially faster than the compensatory adjustment of said magnitude in response to a speed deviation.

4,160,941

MULTI-PURPOSE BATTERY CHARGER

James A. Bennett, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

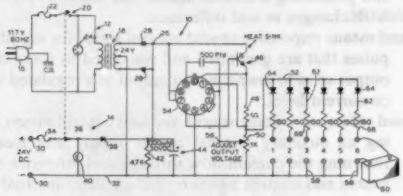
Filed Dec. 1, 1977, Ser. No. 856,751
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—56 **11 Claims**

1. A battery charger for simultaneously charging multiple batteries comprising:

(a) a power supply adapted to be connected to either a source of a.c. power or a source of d.c. power, having a first output and a second output supplying a voltage with reference to one another equal to the charging voltage to be applied to the batteries, having a total amperage output capacity to provide fully charging capability to all the batteries simultaneously, and including means for preventing interaction between the sources of power or damage to the charger if connected to both simultaneously;

(b) a plurality of first connectors connected to said first output on one end and adapted to be connected to one terminal of a battery on the other end; and,

(c) a plurality of second connectors connected to said second output on one end and adapted to be connected to the other terminal of a battery on the other end, said second connectors each including diode means for allowing charging current to pass through a battery connected in proper polarity between one of said first connectors and one of said second connectors while preventing current from the battery from flowing to said power supply or the other batteries being charged simultaneously.



4,160,942

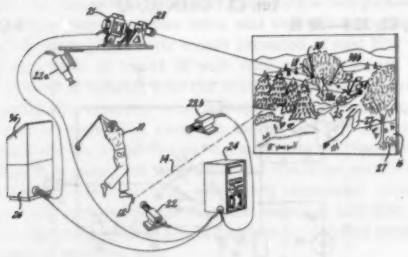
GOLF BALL TRAJECTORY PRESENTATION SYSTEM

Francis deS. Lynch, Mattapoisett; William Gobush, North Darmouth; Paul F. Sullivan; Randall W. Moore, both of Acushnet; Steven L. Haas, Marion; Norman O. Fonteneau, Acushnet, and John W. Jepson, Marion, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Sep. 12, 1977, Ser. No. 832,379

Int. Cl.[2] G03B *21/56*; A63B *69/36*

U.S. Cl. 350—120 **5 Claims**



1. A golf ball trajectory presentation system comprising:

(a) a plurality of electro-optical sensors for simultaneously monitoring the initial values of velocity, launch angle and spin velocity of said golf ball;

(b) means for calculating at least a major portion of the remainder of the trajectory of said golf ball based on said monitored initial values;

(c) a projection screen;

(d) means for forming an image on said projection screen adapted to substitution for said golf ball; and

(e) means for positioning said image according to the calculated trajectory of said golf ball.

4,160,943

SWITCHED CURRENT REGULATOR

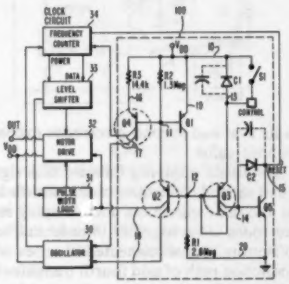
Daniel F. Hopta, Bridgewater, N.J., and Howard R. Beelitz, Gillett, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 15, 1978, Ser. No. 906,006

Int. Cl.[2] G05F *3/08*; G04C *23/12*

U.S. Cl. 323—4 **10 Claims**

1. In combination with a current regulator of the type including first and second terminals for applying an energizing source therebetween; first and second transistors of a first conductivity type having base and emitter and collector electrodes; means connecting the base and emitter electrodes of said second transistor to the collector and base electrodes of said first transistor respectively; means connecting the emitter electrode of said first transistor to said first terminal; first collector load means having substantial direct current impedance connected between the collector electrode of said first transistor and said second terminal; means connected to the collector electrode of said second transistor for conditioning said transistor to conduct current between its collector and emitter electrodes, the foregoing connections forming means tending to regulate the potential between the emitter electrode of said second transistor and said first terminal; and means connected between said first terminal and the emitter electrode of said second transistor for determining the amplitude of the output current from said regulator; means for disabling the



operation of said current regulator and providing a concurrent reset pulse which means comprises:

a third transistor of said first conductivity type having base and emitter and collector electrodes, with said base electrode connected to the base electrode of said second transistor;

a third terminal for supplying reset pulses to which a first collector of said third transistor is connected; and

switching means having relatively low impedance when closed and relatively high impedance when open for selectively connecting the emitter electrode of said third transistor to said first terminal, said switching means when closed conditioning the emitter-base junction of said third transistor for clamping the potential between said first terminal and the base electrode of said second transistor at a potential insufficiently large to support current flow between the emitter and collector electrodes of said second transistor.

4,160,944

CURRENT AMPLIFIER CAPABLE OF SELECTIVELY PROVIDING CURRENT GAIN

Adel A. A. Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,564

Int. Cl.[2] G05F *3/08*

U.S. Cl. 323—4 **5 Claims**

1. A current amplifier comprising:

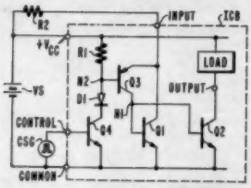
input, common, and output terminals;

first and second transistors of a first conductivity type and a third transistor of a second conductivity type, each of said transistors having a first electrode, and having second and third electrodes at the ends of its principal conduction path, the conductivity of which is controlled responsive to the extent potential between its first and second electrodes exceeds a respective threshold value, the threshold values required for conduction of said first and second transistors

being substantially alike, respective means connecting the first electrodes of said first and second transistors to the third electrode of said third transistor, the second electrodes of said first and second transistors being connected to said common terminal, the third electrode of said first transistor and the second electrode of said third transistor being connected to said input terminal, the third electrode of said second transistor being connected to said output terminal;

a resistance connecting the first electrode of said third transistor to a source of reverse bias potential;

a fourth transistor of said first conductivity type having a first electrode and having second and third electrodes at the ends of its principal conduction path, the conductivity of which is controlled responsive to the extent potential



between its first and second electrodes exceeds a respective threshold value;

means for selectively applying forward bias signal between the first and second electrodes of said fourth transistor for biasing it into full conduction, and clamping its second and third electrodes close together in potential; and

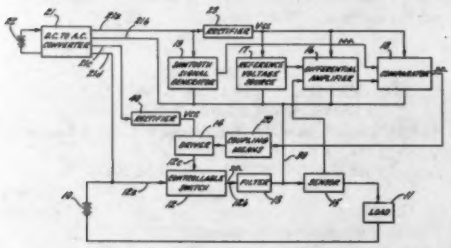
potential offsetting means connected in series with the principal conduction path of said fourth transistor between the first electrode of said third transistor and said common terminal, said fourth transistor oriented in said series connection so its second and third electrodes are closer, respectively, to said common terminal and to the first electrode of said third transistor, said potential offsetting means providing sufficient potential offset to assure said third transistor adequate potential between its second and third electrodes to function in the normal transistor mode.

4,160,945

HIGH EFFICIENCY SWITCHING REGULATOR

Ian A. Schorr, Chicago, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Sep. 16, 1977, Ser. No. 833,765
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—17 **15 Claims**



1. In a switching regulator for generating controllable pulses from a primary d-c. voltage source and then smoothing said pulses to form a d-c. output that varies according to the changes in said pulses, the improvement comprising

a reference voltage source for establishing a d-c. reference signal that varies in magnitude with any variations in the magnitude of the d-c. output but with a substantially constant differential in magnitude between the reference signal and the d-c. output,

sensing means for generating a signal that varies in accordance with changes in the voltage or current level of the d-c. output,

control means for detecting the difference between said reference signal and the signal from said sensing means and producing a control signal that varies in accordance with changes in said difference,

and means responsive to said control signal for adjusting the pulses that are generated and smoothed to form said d-c. output so as to maintain said output at a regulated voltage or current level,

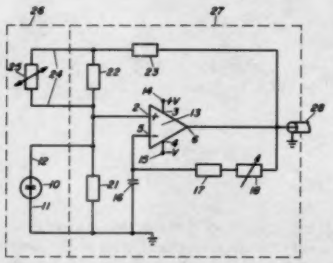
said reference voltage source and said control means including an auxiliary internal power supply and means for returning the current flow through said reference voltage source and control means to said auxiliary internal power supply to minimize power losses in said reference voltage source and control means.

4,160,946

DEVICE FOR MEASURING CONDUCTIVITY OF A SOLUTION

Giovanni Frigato, Medolla, Italy, assignor to Sandoz Ltd., Basel, Switzerland

Filed Oct. 13, 1976, Ser. No. 731,668
Claims priority, application Italy, Oct. 14, 1975, 69553 A/75
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—30 R **3 Claims**

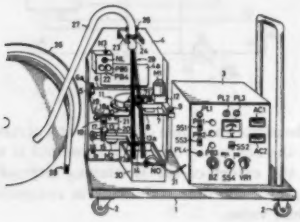


1. A device for measuring the conductivity of a solution, comprising a single elongated probe having at least two electrodes of opposite polarity exposed at its free end for immersion in the solution, and converter means comprising one single difference amplifier operating as an oscillator for converting the output from the electrodes which is proportional to the conductivity of the solution into an output having a frequency which is proportional to said conductivity, the amplifier having two supply inputs, a noninverting input, an inverting input and an output, the output from the one electrode being connected to the non-inverting input of the amplifier and the other electrode being earthed, the output for measurement being that taken from the output of the amplifier, and first and second feedback networks provided between the output of the difference amplifier and the two inputs, in which a variable resistor for adjusting the frequency of the output from the amplifier is included in the first of said networks.

4,160,947
APPARATUS AND METHOD FOR ELECTRICALLY TESTING MULTI-CORE CABLE

Shogo Tanno, Nishinomiya, and Masateru Hirose, Takarazuka, both of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Oct. 25, 1977, Ser. No. 845,363
Claims priority, application Japan, Oct. 26, 1976, 51-128947
Int. Cl.[2] G01R *31/12, 31/02*
U.S. Cl. 324—54 25 Claims



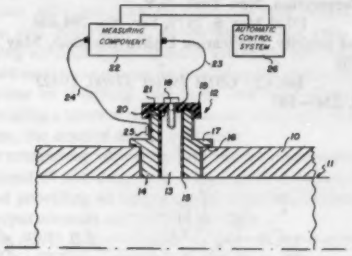
1. An apparatus for electrically testing a multi-core cable having a first end and a second end and including a plurality of insulated cores, each core comprising a conductor wire and an insulation covering said conductor wire, comprising: holding means for collectively holding said insulated cores of said multi-core cable at said first end, collective conductor means for collectively rendering conductive the conductor wires of all the cores of said multi-core cable at said first end, the cores of said multi-core cable being isolated from each other at said second end, core pick-up means operatively coupled to said core holding means for picking up said cores on a one by one basis at said first end, said core pick-up means transferring said picked up core along a predetermined path of travel, core separating means provided along said path of travel of said core pick-up means for electrically separating a core picked up by said core pick-up means from said collective conductor means, measuring electrode means provided at said first end along said path of travel of said core pick-up means and adapted to be in contact with the conductor of said picked up and electrically separated core, voltage source means coupled between said measuring electrode means and said collective conductor means at said first end for supplying a voltage therebetween, and means for measuring the electrical conduction characteristic between said electrically separated core in contact with said measuring electrode means at said first end and the remaining cores in contact with said collective conductor means at said first end.

4,160,948
MONITORING EFFECTS OF A LIQUID ON METALLIC INSTALLATIONS

Daniel Tytgat, Brussels, and Albert Degols, Berg, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Nov. 28, 1977, Ser. No. 855,388
Claims priority, application France, Nov. 26, 1976, 76 35990
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 P 18 Claims

1. Process for monitoring the corrosive, erosive and/or encrusting nature of a liquid with respect to a metallic installation, comprising: immersing a metallic probe into the liquid whereby a double layer is created at the interface between the probe and the liquid; immersing an auxiliary electrode into the liquid near the probe so that the auxiliary electrode is electrically insulated from the probe and measuring the differential capacitance of the double layer and the electrical resistance

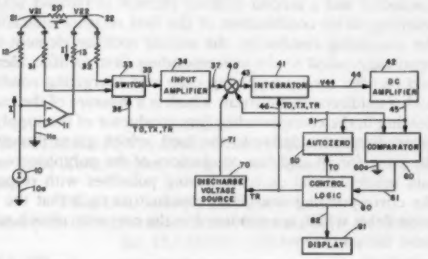


between the probe and the auxiliary electrode, which are representative of the surface condition of the probe.

4,160,949
AUTO-ZEROED OHMMETER

Dennis G. McFayden, San Diego, Calif., assignor to California Instruments Corporation, San Diego, Calif.

Filed Mar. 6, 1978, Ser. No. 883,711
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—62 8 Claims



1. An ohmmeter comprised of:

current circuit means having first and second leads for connection to respective terminals of an unknown resistor to supply current thereto for generation of first and second voltages at said terminals;

sensing circuit means having third and fourth leads for connection to said terminals of said unknown resistor for sensing and scaling said first and second voltage to third and fourth voltages respectively;

reference point voltage generator means for producing during a time period of predetermined duration, a ramp voltage with a slope proportional to the difference between said fourth voltage and a multiple of said third voltage to thereby generate a reference point voltage at the end of said time period;

means for reducing said reference point voltage at a predetermined rate and for measuring the time interval required to reduce said reference point voltage to said multiple of said third voltage; and

means for multiplying said time interval by a predetermined constant to thereby compute the resistance of said unknown resistor.

4,160,950

CURRENT MEASURING APPARATUS

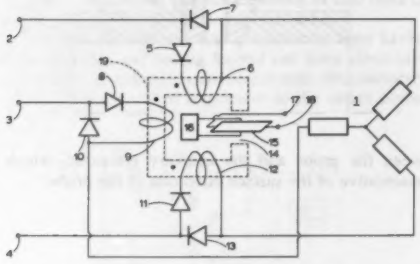
John A. Houldsworth, Croydon, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1977, Ser. No. 794,404

Claims priority, application United Kingdom, May 10, 1976, 19111/76

Int. Cl.[2] **G01R** *19/00, 33/00, 19/22*

U.S. Cl. 324—107 **4 Claims**



1. Apparatus for producing a signal whose average value is representative of the sum of the currents flowing in the conductors of a polyphase electrical supply to a load, comprising a plurality of line conductors coupling the polyphase electric supply to the load, a core forming a magnetic circuit in which is positioned a Hall-effect magnetosensitive device, an individual energizing conductor magnetically coupled to the core of the magnetic circuit corresponding to each said line conductor of the polyphase supply, and a rectifier means in series with each of the line conductors, said rectifier means comprising a first rectifier element in series with a corresponding energizing conductor and a second rectifier element in parallel with the resulting series combination of the first rectifier element and the energizing conductor, the second rectifier element being oppositely poled to the corresponding first rectifier element, said rectifier means supplying each said energizing conductor with a unidirectional current which is a measure of the current flowing in the corresponding line conductor of the supply in a given direction relative to the load, which given direction is the same for all said line conductors of the polyphase supply, said unidirectional currents having polarities with respect to the corresponding energizing conductors such that the magnetic fields which are produced in the magnetic circuit will all have the same sense.

4,160,951

METHOD OF REGENERATING ASYNCHRONOUS DATA SIGNALS AND APPARATUS FOR PERFORMING THE METHOD

Per-Olov Thyselius, Tyreso, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 31, 1977, Ser. No. 829,481

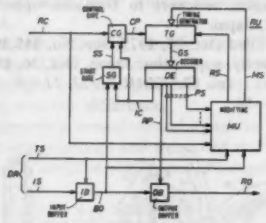
Claims priority, application Sweden, Sep. 15, 1976, 7610212

Int. Cl.[2] **H04L** *25/20*

U.S. Cl. 325—13 **7 Claims**

1. A method for regenerating asynchronous data characters of a given character structure containing data element which arrive on a transmission line time-distorted and at an incoming signalling rate which deviates from a nominal signalling rate, the characters after detection being supplied, at a character rate determined by the arriving elements, to a regeneration device which retransmits the characters to the transmission line at an outgoing signalling rate determined by a clock controlling the regeneration device, said regenerating method comprising the steps of temporarily storing at least one element of each of the supplied characters while the retransmission of the previous character progresses,

establishing the time difference between the starting time of each supplied character and the expected completion time for the character retransmitted at the respective starting time, and



utilizing the established time difference at a certain instant to shorten the character being retransmitted at said certain instant, the extent of the shortening depending on the magnitude of the time difference in comparison with a given limit value.

4,160,952

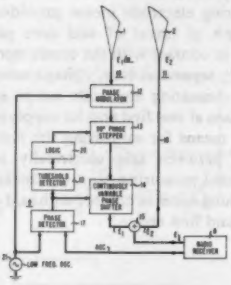
SPACE DIVERSITY RECEIVER WITH COMBINED STEP AND CONTINUOUS PHASE CONTROL

Kurt L. Seastrand, Jr., Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 12, 1978, Ser. No. 905,156

Int. Cl.[2] **H04B** *7/04*

U.S. Cl. 325—369 **5 Claims**



1. In a space diversity system, a receiver including:

first and second antenna circuits **(10, 11)**;

means **(12, 21)** for phase modulating the signal in one of said antenna circuits **(10)**;

means **(15)** for combining the signals in said antenna circuits **(10, 11)**;

and means **(8, 17, 21)** for detecting the amplitude modulation produced in said combined signals by said phase modulation;

characterized in that:

said one antenna circuit **(10)** includes a 90 degree phase stepper **(13)** and a continuously variable phase shifter **(14)**;

and in that said receiver further includes a control circuit **(9)** for controlling the combined phase shift produced by the phase stepper **(13)** and the variable phase shifter **(14)** in response to the detected amplitude modulation.

4,160,953

SELF-OSCILLATION MIXER CIRCUITS

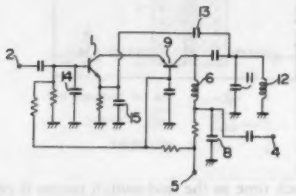
Shigeo Matsuura; Toshio Nagashima, both of Yokohama, and Mitsuhisa Shinagawa, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 13, 1978, Ser. No. 885,978

Claims priority, application Japan, Mar. 11, 1977, 52-25952; Mar. 11, 1977, 52-25953

Int. Cl.[2] H04B *1/28*

U.S. Cl. 325—440 13 Claims



1. A self-oscillation mixer circuit comprising:

(a) a cascade amplifier circuitry including a first transistor of a common emitter connection and a second transistor of a common base connection having the emitter connected in cascade to the collector of said first transistor, said cascade amplifier circuit having an input circuitry including the base and the emitter of said first transistor,

(b) means for supplying a high frequency signal to be converted in frequency to said input circuitry,

(c) means connected to the collector of said second transistor for deriving an intermediate frequency signal produced through frequency conversion of said high frequency input signal,

(d) a resonance circuitry coupled to the collector of said second transistor for determining a local oscillation frequency, and

(e) feedback means connected between said input circuitry and said resonance circuitry to feedback the output from said resonance circuitry to said input circuitry.

4,160,954

MULTIPLE RATE DISCHARGE CIRCUIT FOR INTEGRATOR, ESPECIALLY FOR USE IN COMPUTERIZED AXIAL TOMOGRAPHY

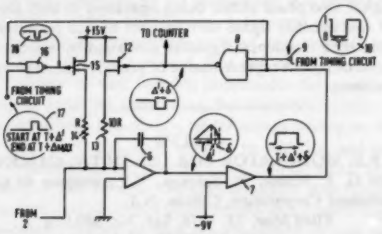
Godfrey N. Hounsfield, Newark, and Richard G. Gillard, Uxbridge, both of England, assignors to E M I Limited, Hayes, England

Filed Oct. 19, 1977, Ser. No. 843,515

Claims priority, application United Kingdom, Nov. 12, 1976, 47143/76

Int. Cl.[2] H03K *4/50, 5/12*

U.S. Cl. 328—127 6 Claims



1. An electrical signal measuring arrangement comprising:

(a) an integrator circuit connected to receive the signals to be measured,

(b) means for applying said signals to said integrator circuit for a predetermined charge period (T)

(c) means, effective from the expiry of said period (T), to cause said integrator to discharge at a first rate, and including an electrically resistive discharge path connected to said integrator circuit by way of a switchable means for enabling or disabling said path, and control means for generating a control signal for controlling said switchable means, the control means including

(i) a comparing means for comparing the instantaneous output of said integrator circuit with a reference value and providing an output signal when said instantaneous output exceeds said reference value,

(ii) an AND gate connected to receive the output signal from said comparing means and an electrical waveform defining charge and discharge periods for said integrator circuit and generating said control signal, and

(iii) means for applying said control signal to said switchable means to enable said path only when the output of said integrator circuit exceeds said reference value during said discharge periods, and

(d) means effective from the expiry of a predetermined time Δ′ following the expiry of the charge period (T) to cause said integrator circuit to discharge at a second rate, faster than the first-mentioned rate;

wherein said means effective to cause said integrator circuit to discharge at said second rate includes said resistive discharge path, said switchable means and said control means and, in addition, a further electrically resistive discharge path, of lower resistance than said first-mentioned path and connected in parallel therewith, a further switchable means, for enabling or disabling said further path, and a further control means for generating a further control signal for controlling said further switchable means.

4,160,955

COMPATIBLE AM-FM FREQUENCY DISCRIMINATOR

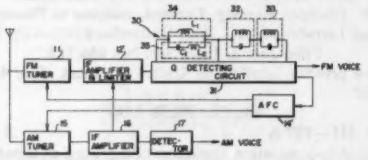
Takeo Sato, Kobe, Japan, assignor to Fujitsu Ten Limited, Japan

Filed Dec. 5, 1977, Ser. No. 857,445

Claims priority, application Japan, Dec. 11, 1976, 51/149104

Int. Cl.[2] H03D *5/00*

U.S. Cl. 329—2 20 Claims



8. A compatible AM-FM frequency discriminator, comprising:

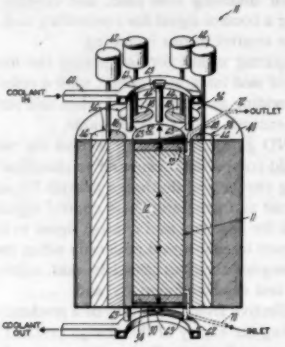
a quadrature detecting circuit having means for applying AM and FM intermediate frequency signals and first, second, and third means for connecting a phase shifter group; and

a phase shifter group, said phase shifter group including fourth means for providing abrupt phase variations at both the AM and FM intermediate frequencies electrically connected to said first and second means, and fifth means for providing 90° phase shifts at both the AM and FM intermediate frequencies electrically connected to said second and third means.

4,160,956
NUCLEAR-PUMPED URANYL SALT LASER

Walter J. Fader, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 26, 1976, Ser. No. 708,366
Int. Cl.[2] H01S 3/09
U.S. Cl. 331—94.5 P 7 Claims



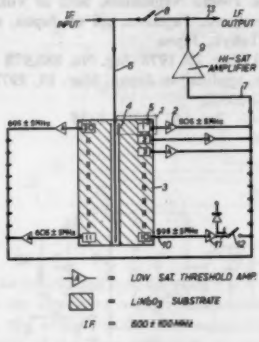
5. A nuclear-pumped laser comprising an elongated laser cavity with a core of a combined lasing and fissionable composition consisting essentially of a uranyl salt with a UO_2^{++} uranyl ion enriched in the U^{235} isotope sufficient to sustain a fission chain reaction, the uranyl ion providing a lasing medium adapted to be nuclear radiation pumped by the direct excitation thereof with the products of a fission chain reaction and secondary electrons of the core to provide a lasing transition between a low-lying vibrational level of the first triplet electronic state and an upper vibrational level of the singlet ground state of the uranyl ion; longitudinally spaced parallel reflecting mirror means, fully and partially reflective respectively, at opposite longitudinal ends of the laser cavity for extracting a longitudinally transmitted laser pulse from the core, and fission control means encircling the core selectively operable for causing an above-prompt critical power transient of the core for nuclear radiation pumping of the uranyl ion for generating a laser pulse.

4,160,957
SIGNAL RE-GENERATION APPARATUS

David W. Jesinger, Romsey, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jan. 3, 1978, Ser. No. 866,712
Claims priority, application United Kingdom, Jan. 4, 1977, 00008/77
Int. Cl.[2] H03B 5/30
U.S. Cl. 331—107 A 5 Claims

1. Signal re-generation apparatus comprising an input terminal means for receiving a signal to be re-generated; a plurality of surface acoustic wave filters connected to said terminal, each said filter having a different pass band; a plurality of threshold amplifier means connected respectively to said filters, one for each said filter, for passing only those signals which are above a predetermined threshold level; an amplifier connected to said threshold amplifier means and having an output coupled to said filters in parallel thereby to define an oscillatory feedback loop; and switch means operatively associated with the loop and effective upon operation to quench oscillation, wherein when a signal to be re-generated is within the pass band of one of the filters and above the predetermined threshold level of the threshold amplifier means and is applied to the input terminal, the threshold amplifier means associated with that filter passes the signal applied thereto so that oscillation takes place around the loop thereby to re-generate the said

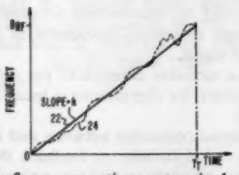


signal until such time as the said switch means is operated to quench oscillation.

4,160,958
SAMPLING LINEARIZER UTILIZING A PHASE SHIFTER

James H. Mims, Hanover, and Francis W. Hopwood, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1978, Ser. No. 935,240
Int. Cl.[2] H03B 23/00
U.S. Cl. 331—178 15 Claims



1. A FM waveform generation system including a sampling linearizer for improving the accuracy of a generated FM waveform signal with respect to a desired frequency rate of change, said sampling linearizer comprising an oscillator for generating a signal at a predetermined reference frequency; a mixer governed by said FM waveform signal and another signal to generate a first signal representative of said generated FM waveform signal; a sampler for sampling said first signal at predetermined sampling times to generate a second signal representative of the inaccuracies in said generated FM waveform with respect to said desired frequency rate of change; a linearizing servo controller governed by said second signal to reduce said inaccuracies in said FM waveform generation; and

a phase shifter disposed between said oscillator and said mixer and responsive to the predetermined reference frequency signal of said oscillator to generate said another signal, said phase shifter being operative to shift the phase of said another signal with respect to said predetermined reference frequency signal as governed by a sequence of control signals representative of predetermined phase shift values.

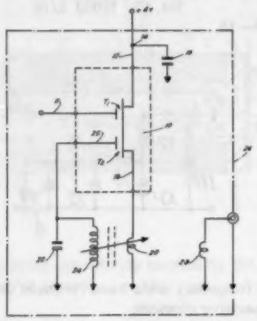
4,160,959
R.F. MODULATOR FOR USE IN T.V. GAMES

Stephen G. T. Maine, Ft. Salonga, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Filed Mar. 23, 1978, Ser. No. 889,973
Int. Cl.[2] H03C 1/36
U.S. Cl. 332—31 T 19 Claims

1. Apparatus for modulating a signal in accordance with an input signal, said apparatus comprising: a voltage source; dual

gate means having first and second input terminals and an output circuit, said first input terminal being operatively connected to receive the input signal; resonant frequency means, operatively connected to said second input terminal, for generating the signal to be modulated; inductance means operatively



inductively coupled to said resonant frequency means; said output circuit and said inductance means being operatively connected between said source and ground; and an output means operatively connected to said resonant frequency means.

4,160,960

POWER-DIVIDING AND MODULATING ARRANGEMENT

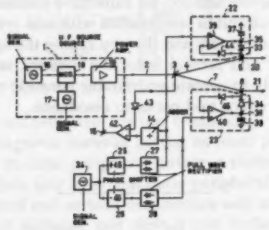
Pieter Bikker, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,929

Claims priority, application Netherlands, Apr. 8, 1976, 7603687

Int. Cl.[2] H03C *1/08;* G01S *1/38*

U.S. Cl. 332—40 **3 Claims**



1. A power divider and modulator circuit comprising means for generating a HF carrier signal having an output connected to a common terminal, said carrier signal generating means including modulator means for modulating said carrier signal, at least two variable impedances, a separate quarter wavelength transformer connecting each of said variable impedances to said common terminal, first and second means each coupled to one of said variable impedances for producing a modulating signal for controlling the impedance value of the associated variable impedance, adder means having an output and a first and second input coupled to said first and second means, respectively, for producing an output signal proportional to the sum of said modulating signals and means for coupling said output of said adder means to a control input of said modulator means so that the amplitude of said carrier signal is modulated by a signal proportional to the sum of said modulation signals.

4,160,961

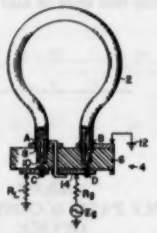
PRINTED WIRING BOARD MOUNTING AND INTERCONNECTION OF COAXIAL CABLE TRANSFORMERS AND THE LIKE

Richard A. Bory, and Alexander F. Hogg, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 22, 1977, Ser. No. 818,049

Int. Cl.[2] H01P *5/10, 3/06;* H05K *1/18, 1/10*

U.S. Cl. 333—27 **2 Claims**



1. In a coaxial cable network an improvement comprising:

at least one predetermined length of coaxial cable having a first and a second end and having an inner and an outer conductor, said at least one coaxial cable being shaped so that two of said ends are in substantially the same plane and so that said two ends are essentially parallel and closely spaced; and

a printed wiring board having wiring means on each of two opposite sides, said outer conductor at each of said two ends of said at least one coaxial cable are electrically and mechanically connected to one of said opposite sides, said inner conductor at each of said two ends of said at least one coaxial cable are electrically and mechanically connected to the other of said opposite sides, said inner conductor at one of said two ends being electrically connected to said outer conductor at the other of said two ends by means of a plated through hole in said printed wiring board to minimize the inductance in said electrical connection.

4,160,962

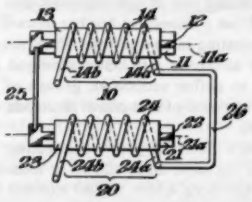
DUAL SECTION DISTRIBUTED PARAMETER DELAY-LINE

Andre de Keyser, Ronse, and Laurent Seynaeve, St. Elooi-Vijve, both of Belgium, assignors to Sprague Electric Company, North Adams, Mass.

Filed Nov. 4, 1977, Ser. No. 848,541

Int. Cl.[2] H03H *7/30;* H01P *1/18, 9/00;* H04N *9/535;* 333 *29;31 R;31 C*

U.S. Cl. 333—141 **6 Claims**



1. An electromagnetic delay-line for delaying the luminance signal in a color television receiver is comprised of exactly two essentially identical delay-line sections, each of said sections comprising an elongated mandrel with surface portions thereof being electrically conductive and a continuous wire coil being wound about and being insulated from said mandrel, said con-

ductive surface portions of said two mandrels being electrically interconnected, said mandrels having parallel axes and being positioned side by side, a coil end of one and a coil end of the other of said sections being electrically interconnected, said interconnected coil ends being two laterally adjacent ends and the winding direction of one of said coils being the same as that of the other with respect to one axial direction so that a uniform unidirectional magnetic field of slowly varying magnitude having flux lines parallel to said axes will produce no net voltage between the free ends of said interconnected coils.

4,160,963

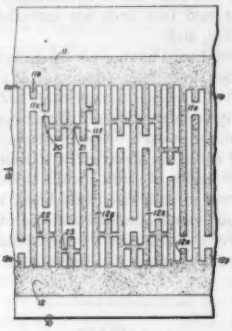
PLURAL SUPPLY PATH ACOUSTIC SURFACE WAVE DEVICE

Ronald M. Hays, Jr., Walnut Creek, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 21, 1977, Ser. No. 817,757

Int. Cl.[2] H03H *9/04, 9/30, 9/32;* H01L *41/10*

U.S. Cl. 333—151 **3 Claims**



1. In an acoustic surface wave device having a substrate provided with at least a surface of piezoelectric material, an interdigital transducer comprising:

a plurality of bus bars disposed on the piezoelectric surface of said substrate in spaced substantially parallel relation with respect to each other and adapted to be excited by respective electrical signals of different phase,

plural sets of elongated electrodes corresponding in number to said plurality of bus bars, each of said electrodes in a corresponding one of said electrode sets extending transversely from a respective bus bar toward another bus bar but terminating in spaced relation thereto,

said plural electrode sets being arranged in interdigitated relation to define successive groups of individual electrodes from each of said plural electrode sets in a continuing series,

shorting bars electrically interconnecting respective electrodes of the same electrode set at locations spaced from the bus bar from which the set extends to provide alternate current paths for the electrodes so interconnected,

an insulation layer on the piezoelectric surface of said substrate and covering said plural electrode sets, and

each of said shorting bars which electrically interconnect respective electrodes of one of said plural electrode sets being electrically isolated by said insulation layer from said shorting bars which electrically interconnect respective electrodes of another of said plural electrode sets.

4,160,964

HIGH FREQUENCY WIDE BAND RESONANT CIRCUIT

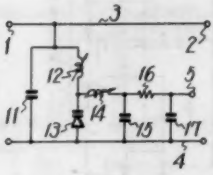
Fumio Ishikawa, Isehara, and Yukio Tsuda, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 15, 1977, Ser. No. 816,200

Claims priority, application Japan, Jul. 22, 1976, 51/87518

Int. Cl.[2] H03J *3/18*

U.S. Cl. 334—15 **1 Claim**



1. A high frequency wide band resonant circuit comprising:

a first capacitive element;

a first series circuit including a first inductive element and a voltage controlled variable capacitance element and being connected in parallel to said first capacitive element;

a second series circuit including a second inductive element and a second capacitive element, said second series circuit being connected in parallel to said variable capacitance element with an end of said second inductive element connected to said first series circuit between said first inductive element and said variable capacitance element and an end of said second capacitive element being connected to a junction of said variable capacitance element with said first capacitive element;

means for supplying a control voltage for said variable capacitance element across said second capacitive element;

a resistor having one end connected between the junction of said second inductive element with said second capacitive element, and the other end of said resistor being connected to said means for supplying a control voltage; and

a third capacitive element connected in series with said resistor across said second capacitive element for forming a π-type-circuit in cooperation with said resistor and said capacitive element and thereby raising the apparent impedance of said second inductive element in a frequency band likely to contain undesirable parasitic resonance and thereby reduce said parasitic resonance.

4,160,965

POLARIZED MINIATURE RELAY

Ulrich Kobler, and Horst Tamm, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 14, 1977, Ser. No. 815,829

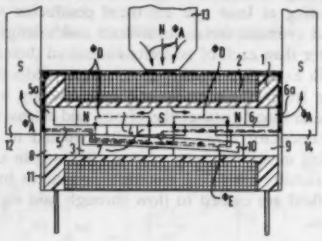
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632126

Int. Cl.[2] H01H *51/22*

U.S. Cl. 335—79 **20 Claims**

1. In a polarized miniature relay having a switching space positioned interior of the body of a coil winding with a movable armature in the switching space adapted to operate at least one contact spring unit, the improvement of a bar permanent magnet positioned in the switching interior of the coil winding space parallel with the coil axis and extending longitudinally thereof, the bar magnet being insertable into the switching

space axially of the coil, the bar magnet forming a rigid nonrotating member to which at least one contact carrier is affixed,



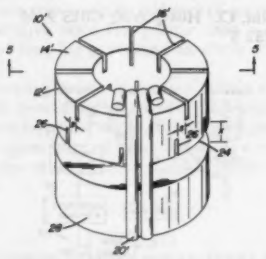
and the armature being operatively carried by the bar magnet and rotatable relative thereto.

4,160,966

STABILIZED REACTOR

Theodore R. Kennedy, Willingboro, N.J., assignor to Inductotherm Corp., Rancocas, N.J.

Filed Sep. 6, 1977, Ser. No. 830,733
Int. Cl.[2] H01F *21/08*
U.S. Cl. 336—155 **8 Claims**



1. A stabilized saturated reactor, comprising:

a core of magnetic material having an inner peripheral surface and an outer peripheral surface, a slotted end surface intermediate said inner and outer peripheral surfaces, and an unslotted end surface intermediate said inner and outer peripheral surfaces, said slotted end surface being provided with plural spaced slots,

each of said slots being open along said slotted end surface from said inner peripheral surface to said outer peripheral surface,

each of said slots extending from said slotted end surface along the axial dimension of the core to a depth less than one-half the axial dimension of the core,

each of said slots having a width substantially less than the cross-sectional dimensions of said core,

a winding connectable to an AC source, said winding surrounding said peripheral surfaces and said end surfaces, the cross-section of said winding being greater than said width of each of said slots,

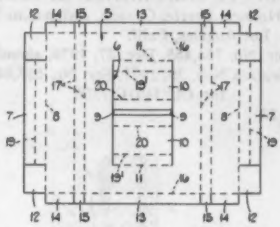
whereby said winding when connected to said AC source establishes an unsaturated magnetic field through the volume of said core between said slotted end surface and approximately the depth of said slots and a saturated magnetic field through the volume of said core between said unslotted end surface and approximately the depth of said slots.

4,160,967

ELECTRICAL COIL ASSEMBLY

Keith J. W. Beech, Walsall, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 28, 1977, Ser. No. 819,671
Claims priority, application United Kingdom, Aug. 21, 1976, 34933/76
Int. Cl.[2] H01F *27/30*
U.S. Cl. 336—209 **10 Claims**



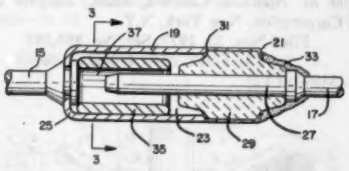
1. An electrical coil assembly comprising an annular electric coil which has a rectangular aperture therethrough and has inner and outer peripheries and front and rear faces, and a covering over said coil, said covering being formed of a flexible, electrically insulating sheet which, when folded, is shaped to completely cover said inner and outer peripheries and said front and rear faces of said coil to provide a substantially dustproof seal for the coil when secured in position, said sheet having a rectangular aperture therethrough and including flaps which extend along opposite sides of said sheet, engage in said rectangular aperture in said sheet so as to overlie one pair of opposite side edges of the inner periphery of said coil, and are wider than the corresponding dimension of said rectangular aperture in said sheet.

4,160,968

NORMALLY OPEN, THERMAL SENSITIVE ELECTRICAL SWITCHING DEVICE

Sarmukh S. Saini, Dayton, Ohio, assignor to Emerson Electric Co., Dayton, Ohio

Filed May 31, 1977, Ser. No. 801,746
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—404 **4 Claims**



1. A temperature-sensitive electrical switching device, having first and second current carrying electrical leads, for completing an electrically conductive circuit between the first and second electrical leads when the temperature of the switching device exceeds a predetermined temperature level, comprising:

a hollow cylindrical electrically conductive case, having a first end defining an opening into a central cylindrical cavity and a second end which is closed, said case being electrically connected to the first electrical lead,

an electrically conductive member electrically connected to the second electrical lead,

nonconductive means for mounting said conductive member such that it extends into said cylindrical cavity substantially along the central axis of said cavity, said nonconductive means sealing said opening into said cavity, and

a substantially annular, heat fusible pellet defining a central cavity and dimensioned to surround said member without electrically contacting said member, said pellet being fusible at said predetermined temperature to form a volume of electrically conductive liquid sufficient to establish an electrically conductive path between said case and said member regardless of the orientation of said device.

4,160,969

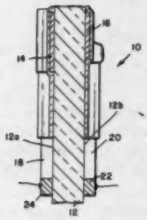
TRANSDUCER AND METHOD OF MAKING

Edward S. B. Holmes, Barrie, Canada, assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 754,465, Dec. 27, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 855,045

Int. Cl.[2] H01C *7/00*

U.S. Cl. 338—23 **8 Claims**



8. A transducer made by a process comprising the steps of:
preparing a substrate for metal deposition;
imprinting conductor means onto a surface of said substrate;
vapor depositing a layer of resistive material onto said surface;
removing a portion of said material to produce a thermal transducer conductively engaging said conductor means;
applying a glass-containing paste to said thermal transducer; and
firing the paste to form a glass coating on said thermal transducer.

4,160,970

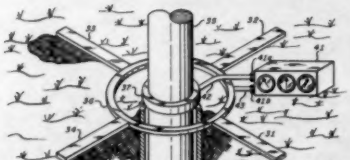
ELECTROMAGNETIC WAVE TELEMETRY SYSTEM FOR TRANSMITTING DOWNHOLE PARAMETERS TO LOCATIONS THEREABOVE

Alexander M. Nicolson, Concord, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 25, 1977, Ser. No. 855,095

Int. Cl.[2] G01V *1/40*; H04B *13/02*

U.S. Cl. 340—18 LD **4 Claims**



1. A telemetry system for transmitting down borehole measured parameters to a receiving location thereabove during the operation of an apparatus of the kind which includes a sectionalized metallic rod substantially extending to the depth of said borehole comprising:
means for exciting a voltage between predetermined adjacent sections of said metallic rod;
means electrically coupled to said metallic rod for sensing electrical signals; and
probe means for coupling to an electric field existing at said receiving location in response to said voltage excitation including at least one electrical conductor with preselected cross-sectional dimensions and a length which is greater than each of said cross-sectional dimensions, said length extending radially from a first predetermined distance from said metallic rod continuously to a second predetermined distance therefrom, said at least one electrical conductor being electrically coupled to said signal sensing means whereby currents induced in said at least one radially extending electrical conductor by said electric field are caused to flow through said signal sensing means.

4,160,971

TRANSPONDERS

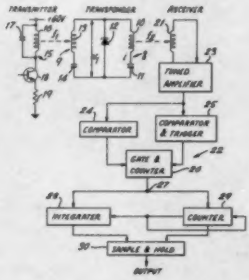
Barry E. Jones, and John A. Smith, both of Altrincham, England, assignors to National Research Development Corporation, London, England

Filed Apr. 29, 1976, Ser. No. 681,743

Claims priority, application United Kingdom, May 2, 1975, 18471/75

Int. Cl.[2] H04Q *9/00*; G01S *9/56*

U.S. Cl. 340—152 T **33 Claims**

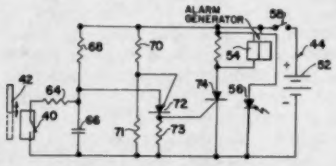


1. Information-transmission apparatus comprising:
a transmitter for transmitting signals at a first frequency, and transponder apparatus including:
a non-linear device having a non-linear impedance,
a receive resonant circuit connected to the non-linear device for obtaining power from transmissions from the transmitter to vary the non-linear impedance of the said device and generate a non-sinusoidal waveform across the device when transmissions are received, the receive resonant circuit being at least broadly tuned to a frequency range in which the first frequency occurs,
a transmit resonant circuit, resonant at a second frequency, connected to the non-linear device, and
transducer means for varying the resonant frequency of the transmit resonant circuit;
a receiver having a receiving circuit at least broadly tuned to a frequency range in which the second frequency occurs; and
a frequency indicating circuit, coupled to the receiving circuit, for providing a signal indicative of the frequency of a signal received by the receiving circuit.

4,160,972
ALARM APPARATUS FOR MOVABLE BARRIER MEMBERS

Kenneth La Mell, Ridgewood, N.J., and Gerry Schneider, Irvington-on-Hudson, N.Y., assignors to ADCO Venetian Blind Company, New York, N.Y.

Filed May 18, 1978, Ser. No. 906,996
Int. Cl.[2] G08B 13/08
U.S. Cl. 340—541 10 Claims



1. An alarm apparatus for use with a frame member defining an opening and a movable barrier member in the opening which is movable relative to the frame member, said alarm apparatus comprising:

switch means for mounting on one of said frame and barrier members, said switch means being switchable between a first operative state and a second operative state, and being normally in said first operative state;

actuating means for mounting on the other of said frame and barrier members, said actuating means switching said switch means to said second operative state when said actuating means is in a predetermined position relative to said switch means;

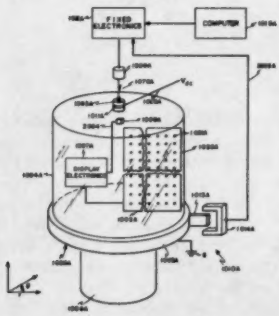
timing means responsive to said switch means being in said first operative state for greater than a predetermined period of time for generating an alarm condition signal; and

alarm generating means responsive to said alarm condition signal for generating an alarm whereby generation of an alarm is delayed for said predetermined period of time to prevent generation of false alarms as a result of minor movements of said barrier member relative to said frame member.

4,160,973
THREE-DIMENSIONAL DISPLAY

Edwin P. Berlin, Jr., Huntington, N.Y., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 11, 1977, Ser. No. 840,881
Int. Cl.[2] H04N 9/58, 5/70, 3/14; H04B 9/00
U.S. Cl. 340—718 31 Claims

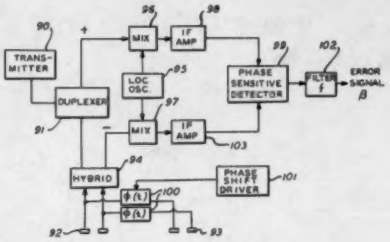


30. A display device to exhibit a three-dimensional image, that comprises, in combination: an array of light sources; energizing means to power the light sources in a determined fashion; and means to move the array and the energizing means together in a determined fashion; the energizing means and the means to move the array acting in combination with the array to effect scanning to provide a three-dimensional image.

4,160,974
TARGET SENSING AND HOMING SYSTEM

Gus Stavis, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Oct. 29, 1976, Ser. No. 736,785
Int. Cl.[2] G01S 9/22
U.S. Cl. 343—16 M 13 Claims



7. In a target sensing device a sensor means comprising:

first and second interconnected slotted waveguide antenna means for generating a broad fan beam and a plurality of closely spaced interference lobes contained within said broad fan beam said interference lobes spaced so as to encompass a predetermined target size at a predetermined range,

a phase shifter for continuously varying the positions of said interference lobes within said broad fan beam,

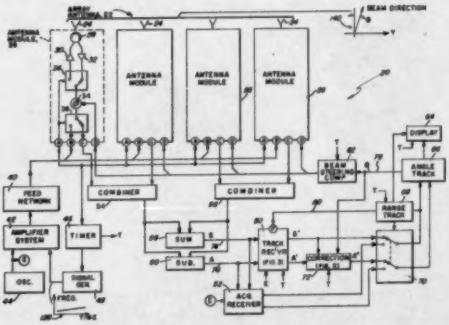
means for detecting said predetermined size target within said interference lobes, and

means combined with said means for detecting for filtering out undesired targets.

4,160,975
CORRECTION CIRCUIT FOR WIDE BANDWIDTH ANTENNA

Fritz Steudel, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 27, 1978, Ser. No. 919,596
Int. Cl.[2] G01S 3/32, 9/22, 3/80
U.S. Cl. 343—16 M 4 Claims



3. In a system for measuring the angle of orientation of a beam of radiation relative to a phased array antenna, said system providing a sum channel signal and a difference channel signal, a correction circuit comprising:

means for differentiating said sum channel signal to provide a derivative thereof;

means for multiplying said derivative by a factor representing the orientation of said beam and by a factor representing the magnitude of the boresight error slope of said phased array antenna to provide said weighted derivative; and

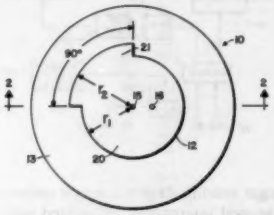
means for subtracting said weighted derivative from said difference signal to provide a corrected difference signal.

4,160,976

BROADBAND MICROSTRIP DISC ANTENNA

Peter J. Conroy, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 12, 1977, Ser. No. 859,370
Int. Cl.[2] H01Q 1/38
U.S. Cl. 343—700 MS **11 Claims**



1. A broadband microstrip disc antenna comprising:

(a) a ground plane formed of conductive material and providing a smooth surface;

(b) a conductive disc positioned parallel to the smooth surface of said ground plane and spaced therefrom a predetermined distance;

(c) dielectric material positioned between said ground plane and said conductive disc;

(d) said conductive disc being electrically connected to said ground plane at approximately the center of said disc;

(e) a sector greater than one-half of said disc having a first radius;

(f) the remaining sector of said disc having a second radius different than said first radius, and

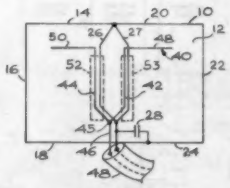
(g) a feed point on said conductive disc.

4,160,977

AUTOMOBILE ANTENNA

Ross A. Davis, 95-461 Kaulia Pl., Mililani Town, Hi. 96789

Filed Feb. 23, 1978, Ser. No. 880,716
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—713 **10 Claims**



1. A vehicle antenna system responsive to both electrostatic and electromagnetic components of a radio signal and presenting an optimum impedance to associated radio circuits, including:

an electrically conductive vehicle body having at least one window opening therein to form a conductive edge;

a first conductor series connected with a first condenser to form a first tuning combination, said first tuning combination being electrically coupled between oppositely disposed points along said conductive edge, said condenser having a magnitude of capacitance sufficient to produce in the medium wavelength radio band electrical resonance of a body loop including at least a portion of said conductive edge;

a plurality of intercoupled, electrically conductive members serially disposed on said window to form at least one antenna element primarily responsive to the electrostatic component of an impinging radio wave;

at least one of said plurality of intercoupled, electrically conductive members being physically closely proximate to said first conductor and parallel thereto but conductively isolated therefrom, whereby capacitive and inductive coupling of radio signals between said first conductor and said at least one of said plurality of intercoupled, electrically conductive members, occurs;

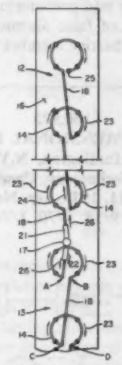
and an output conductor coupled to one of said at least one of a plurality of intercoupled, electrically conductive members proximate to said first conductor.

4,160,978

CIRCULARLY POLARIZED LOOP AND HELIX PANEL ANTENNAS

Raymond H. DuHamel, 12001 Rhus Ridge Rd., Los Altos Hills, Calif. 94022

Filed Aug. 10, 1977, Ser. No. 823,218
Int. Cl.[2] H01Q 9/16, 9/30
U.S. Cl. 343—742 **34 Claims**



1. A circularly polarized antenna assembly comprising a conductive plane, a plurality of adjacent radiating elements each comprising at least one open radiating loop all portions which lie substantially in a plane, means for supporting each of said radiating elements above said conducting plane in line next to one another with the plane of said at least one loop being substantially parallel to the conducting plane, transmission line means connecting said radiating elements in series from one opened end of the loop to an adjacent loop and means for feeding one end of said series of radiating elements, the impedance of said transmission lines and radiating elements selected so that the radiating elements each support a traveling electrical wave equivalent to a traveling wave on a ring to produce circularly polarized radiation.

4,160,979
HELICAL RADIO ANTENNAE

Robert J. Drewett, Swindon, England, assignor to National Research Development Corporation, London, England

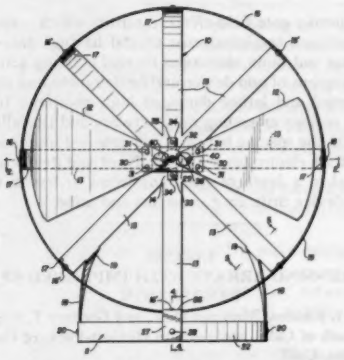
Filed Jun. 20, 1977, Ser. No. 808,384
Claims priority, application United Kingdom, Jun. 21, 1976, 25727/76; Apr. 1, 1977, 13928/77
Int. Cl.[2] H01Q 1/36
U.S. Cl. 343—788 1 Claim

1. An end fed radio antenna comprising a flux-concentrating rod and an extended conductor having an electrical length of one quarter of the design wavelength, said conductor forming a series of insulated coaxial, helical windings of plural turns about said rod, said windings being separated from each other along the length of said rod, adjacent windings reversing the direction of winding and having opposite sense, each winding having the same given number of turns with the turns separated from each other.

4,160,980
DIPOLE ANTENNA WITH PARABOLIC REFLECTOR

James G. Murray, P.O. Box 442, White Rock, S.C. 29177

Filed Oct. 11, 1977, Ser. No. 840,729
Int. Cl.[2] H01L 21/26
U.S. Cl. 343—795 3 Claims

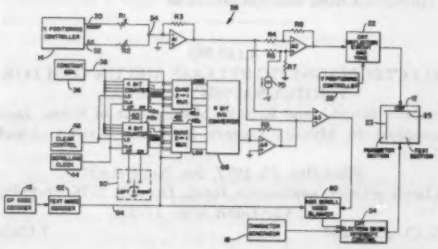


1. A unitized substantially all sheet metal television antenna comprising a substantially parabolically curved horizontal axis frontally open dished reflector, said reflector having a body formed by a plurality of circumferentially equidistantly spaced radial arms integrally joined near the axial center of the reflector and being formed of substantially equal width strips of sheet metal, the zones between said arms being open and unobstructed, an axial annular rim formed of sheet metal joined to the outer ends of the radial arms and forming therewith an integrated reflector structure, the sheet metal rim being formed of a strip having substantially the thickness and width of said radial arms, said rim being coaxial with said reflector axis, a bow tie dipole spaced forwardly of the parabolically curved body of the reflector and spanning the major portion of the diameter of the reflector and being curved longitudinally in general parallelism to the body of the reflector, an axial spacer sleeve anchored to the center portion of the reflector body and projecting forwardly thereof, an insulating plate secured to the forward end of the spacer sleeve, said bow tie dipole being attached to and supported by the insulating plate, an electrical cable having terminals electrically connected to said dipole, said cable extending rearwardly through said spacer sleeve and beyond the rear of said dished reflector for connection with antenna terminals of a television receiver, a supporting base for the antenna including a vertical axis ring formed of sheet metal of substantially the same width and thickness employed for said rim and arms and being positioned somewhat below the bottom of said rim, and plural braces formed of sheet metal having substantially the same thickness and width as the sheet metal forming said ring and interconnecting said ring at plural circumferentially spaced points thereon with a corresponding number of spaced points on the body of said reflector.

4,160,981
CRT VIDEO TEXT LAYOUT SYSTEM HAVING HORIZONTAL SCROLLING

Meredith T. Raney, Jr., Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Jun. 6, 1977, Ser. No. 803,842
Int. Cl.[2] G06K 15/20
U.S. Cl. 340—721 13 Claims



1. In a video layout system of the type having a CRT display screen for viewing parameter information on a first section and text information on a second section, character generating means and vertical and horizontal positioning control means, the horizontal positioning control means including means for generating a ramp signal for controlling the horizontal sweep of an electron beam across the display screen of the CRT, an improvement comprising:

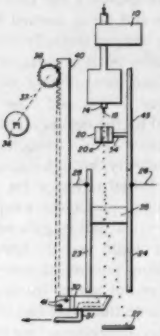
(a) means for selectively offsetting the start of the ramp signal so that any desired portion of text material having a pica format in excess of the width of the portion of the display screen for text material may be viewed to effect a horizontal scrolling of the text material, and

(b) disabling means for selectively blanking the electron beam to prohibit text information from being displayed on the parameter section of the display screen.

4,160,982
ANTI-DISPERSION ACCUMULATOR FOR INK JET PRINTING SYSTEM

Robert I. Keur, Niles, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed Mar. 24, 1978, Ser. No. 889,900
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—75 8 Claims



1. A system for printing by directing ink along a path toward a record medium, comprising:

an ink ejection head defining an orifice for directing ink toward the record medium;

means for characterizing the ink for controlling its path for deposition at predetermined positions on the record medium,

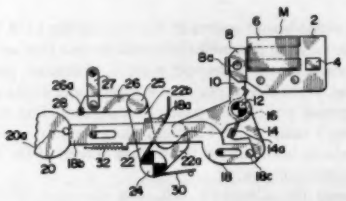
an accumulator normally positioned adjacent the record medium for catching ink directed away from the record medium; and

means, operative upon start-up of the system and shut-down of the system for moving said accumulator between a pair of positions, one position adjacent said ejection head and the other position disposed a predetermined distance away from said ejection head, said accumulator while moving between said positions being oriented to intercept ink projected from said ejection head.

4,160,983
ELECTROMAGNETIC RELEASE MECHANISM FOR PHOTOGRAPHIC CAMERAS

Tetsuhiko Inagaki, and Keisuke Maeda, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Dec. 27, 1977, Ser. No. 864,434
Claims priority, application Japan, Dec. 29, 1976, 51-159831
Int. Cl.[2] G03B *9/08, 17/38*
U.S. Cl. 354—234 7 Claims



1. An electromagnetic release mechanism for a camera comprising:

a release member for initiating a camera shutter operation, said release member being movable between an inoperative position and an operating position for the initiation of said camera shutter operation;

permanent magnet means for retaining said release member in the inoperative position thereof;

electromagnetic means energizable for counteracting said permanent magnet to allow the movement of said release member from said inoperative to said operating position;

charge means including a charging member movable with and relative to said release member, and a biasing spring intercoupling said charging member and said release member and tensioned by the charging member;

a movable member movable, in response to a camera cocking operation, from a first to a second position to move said charging member relative to said release member and charge said spring to bias said release member toward the operating position thereof when said release member is retained at the inoperative position thereof;

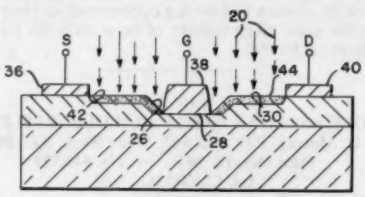
an elastic member for driving said release member from the operating to inoperative position thereof, said movable member being engageable, at the second position thereof, with said elastic member to maintain the latter inoperative; and

means for retaining said movable member at the second position thereof at least from the energization of said electromagnet to the initiation of the camera shutter operation, said movable member being releasable from said second position by means responsive to the camera shutter operation to actuate said elastic member.

4,160,984
SCHOTTKY-GATE FIELD-EFFECT TRANSISTOR AND FABRICATION PROCESS THEREFOR

Glenn O. Ladd, Jr., Rancho Palos Verdes, and Frederick W. Cleary, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 14, 1977, Ser. No. 851,224
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 3 Claims



1. A Schottky-gate field-effect transistor which comprises a III-V compound semiconductor crystal having spaced apart source, gate and drain electrodes thereof defining active current path regions of said device and further including thin inert ion implanted and lattice damaged high resistivity or semi-insulating regions extending only between and laterally coextensive with the spacing between said gate and source and said gate and drain electrodes, respectively, of said device and into said crystal to a depth of 1,000 angstroms or less to thereby minimize device drift, time constants and noise.

4,160,985
PHOTOSENSING ARRAYS WITH IMPROVED SPATIAL RESOLUTION

Theodore I. Kamins, Montain View, and Godfrey T. Fong, Belmont, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 25, 1977, Ser. No. 854,938
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 4 Claims

1. A photosensing device comprising:

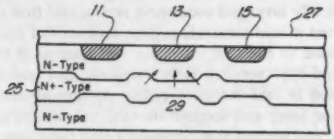
a semiconductor substrate of a first conductivity type;

an intermediate semiconductor layer on said substrate, said

intermediate layer being of the first conductivity type but of higher conductivity than said substrate;

a surface semiconductor layer on said intermediate layer, said surface layer being of the first conductivity type, but of lower conductivity than said intermediate layer;

an array of photosensing elements on said surface layer for detecting charge carriers photogenerated in said surface



layer and said intermediate layer by optical radiation incident on said device;

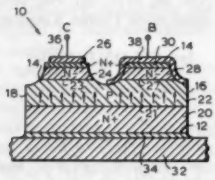
whereby charge carriers created above the region of maximum conductivity will be accelerated toward the nearest of said photosensing elements and charge carriers created below the region of maximum conductivity will be accelerated away from said photosensing elements into said substrate.

4,160,986

BIPOLAR TRANSISTORS HAVING FIXED GAIN CHARACTERISTICS

David M. Johnson, 5509 Harvard, Lubbock, Tex. 79415

Filed Aug. 2, 1976, Ser. No. 710,727
Int. Cl.[2] H01L 29/72
U.S. Cl. 357—36 **8 Claims**



1. A bipolar transistor comprising:

a semiconductor body having first and second opposed surfaces with opposing edge surfaces therebetween;

an emitter region, a base region and a first collector region in said semiconductor body with an emitter-base junction between said emitter and base regions and a base-collector junction between said base and first collection regions;

said emitter region extending to said first surface and said emitter-base junction extending across said semiconductor body and terminating at said edge surfaces such that injection across said emitter-base junction is substantially uniform across said semiconductor body;

said first collector region extending to said second surface;

means for making a low ohmic collector contact to said first collection region at said second surface;

a highly conductive substrate supporting said semiconductor body;

means making a low ohmic emitter contact between said substrate and said first surface of said semiconductor body;

said base region extending to said second surface;

a second collector region in said semiconductor body and independent of said first collector region, said second collector region extending to said second surface; and

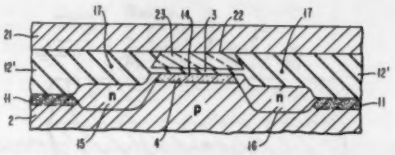
means for making a low ohmic base contact to both said base region and said second collector region at said second surface.

4,160,987

FIELD EFFECT TRANSISTORS WITH POLYCRYSTALLINE SILICON GATE SELF-ALIGNED TO BOTH CONDUCTIVE AND NON-CONDUCTIVE REGIONS AND FABRICATION OF INTEGRATED CIRCUITS CONTAINING THE TRANSISTORS

Robert H. Dennard, Croton-on-Hudson, and Vincent L. Rideout, Mohegan Lake, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 686,969, May 14, 1976, abandoned.
This application Jun. 6, 1977, Ser. No. 804,200
Int. Cl.[2] H01L 27/02
U.S. Cl. 357—41 **44 Claims**



1. A method for fabricating an integrated circuit containing an array of FETs having recessed field oxide isolation between FETs, and associated FET circuits peripheral to the array of FETs but on the same semiconductive substrate, and wherein FETs of the array have a channel region; a gate insulator; a doped polycrystalline silicone gate self-aligned to the field oxide isolation on the sides of the gate in the width direction, the gate neither overlapping nor underlapping the field oxide isolation; source and drain regions being self-aligned to the ends of the gate in the length direction; insulation over the source and drain but not over the gate; metallic-type high electrical conductivity interconnection line; and self-registering electrical connection between the gate and the interconnection line which comprises:

(A) providing a semiconductive substrate of a first conductive type containing active impurities of a first conductive type;

(B) providing an insulator layer on said substrate, which insulator layer is to be subsequently delineated to provide the gate insulator;

(C) depositing a layer of polycrystalline silicon above the insulator layer;

(D) depositing an oxidation barrier layer above said polycrystalline silicon layer;

(E) delineating by masking and etching first predetermined polycrystalline silicon regions to provide the device area;

(F) growing in the etched regions isolation oxide recessed into the substrate to provide insulating field oxide regions between FETs of the array;

(G) delineating by masking and etching second predetermined polycrystalline silicon regions to provide polycrystalline silicon gate regions of the FETs;

(H) thermally diffusing or ion implanting active impurities of a second and opposite type into preselected regions of the semiconductive substrate to provide FET source and drain regions;

(I) thermally growing a silicon dioxide insulating layer over regions of the structure but not over the polycrystalline silicon FET gates which are still protected by an oxidation barrier layer;

(J) removing existing oxidation barrier layer from over the FET gates by use of an etchant;

(K) delineating contact holes to provide vias for achieving electrical connection between metallic interconnection lines and FET source and drain regions;

(L) depositing and delineating a metallic-type high conductivity electrical interconnection pattern that makes electrical connection to the polycrystalline silicon FET gates; and to FET source and drains; and

(M) providing electrical connection to said semiconductive substrate.

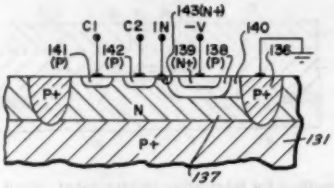
26. An integrated circuit prepared by the method of claim 1.

4,160,988

INTEGRATED INJECTION LOGIC (I-SQUARED L) WITH DOUBLE-DIFFUSED TYPE INJECTOR

Lewis K. Russell, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 454,789, Mar. 26, 1974, abandoned.
This application Jun. 24, 1977, Ser. No. 809,615
Int. Cl.[2] H01L 27/04
U.S. Cl. 357—44 21 Claims



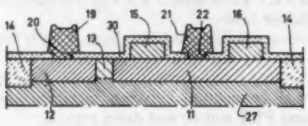
18. In a semiconductor structure, a semiconductor body having a planar surface comprising a body portion of one conductivity type, a first region of opposite conductivity type formed in said body and extending to said surface, spaced second and third collector regions in rectifying contact with said first region and extending to said surface, said second and third collector regions being spaced from said body portion, source means for providing current connected to said first region, said source means comprising a source transistor which has a base region of said one conductivity type and emitter and collector regions of the opposite conductivity type, said source transistor regions extending in the semiconductor body, said collector region of the source transistor extending to said surface and being connected to said first region, lead means for coupling said regions and said body portion to other circuitry and wherein said source transistor base region and said body portion are interconnected by structural means integrated with the semiconductor body for providing a voltage difference between said base region and said body portion, said structural means constituting the sole connection to the base region of said source transistor.

4,160,989

INTEGRATED CIRCUIT HAVING COMPLEMENTARY BIPOLAR TRANSISTORS

Michel de Brebisson, Caen; Jean-Michel Decrouen, Argences, both of France; Wolfgang F. J. Edlinger, Eindhoven, Netherlands, and Jean-Pierre H. Biet, Bieville-Beuville, France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 753,271, Dec. 22, 1976, abandoned.
This application Mar. 17, 1978, Ser. No. 887,646
Claims priority, application France, Dec. 29, 1975, 75 39964
Int. Cl.[2] H01L 27/02
U.S. Cl. 357—44 5 Claims



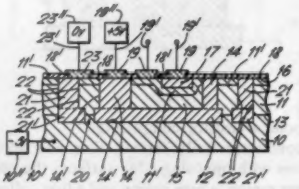
1. An integrated circuit comprising:
a semiconductor substrate portion of a first conductivity type;
a plurality of regions of semiconductor material of a second conductivity type on said substrate portion;
regions of first insulating material adjoining said semiconductor regions, and extending at least partially thereover;
a semiconducting layer of first type conductivity extending partially over said regions of insulating material forming a connection track and partially over said semiconductor regions, said semiconducting layer comprising a monocrystalline portion and a polycrystalline portion;
a first bipolar npn transistor having first, second and third vertically arranged successive zones, said first zone being located in said substrate region, said second zone forming the base of the first transistor and located in one of said second type semiconductor regions, and said third zone located in said monocrystalline portion of said semiconductor layer and located on said one semiconductor region, said second zone separating said third zone from said substrate region.

4,160,990

SEMICONDUCTOR DEVICES AND CIRCUIT ARRANGEMENTS INCLUDING SUCH DEVICES

Jeffrey Kane, Hulme, England, assignor to Ferranti Limited, Hollinwood, England

Filed Nov. 28, 1977, Ser. No. 855,256
Claims priority, application United Kingdom, Nov. 27, 1976, 49577/76
Int. Cl.[2] H01L 27/04
U.S. Cl. 357—48 28 Claims

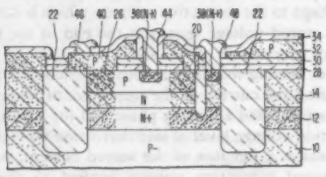


1. A semiconductor device formed in a semiconductor body comprising a substrate of one conductivity type, a thin layer initially wholly of said one conductivity type disposed on said substrate of the same conductivity type, said device having a plurality of constituent components, at least one of the components including a combination of regions comprising a buried layer of said opposite conductivity type at a portion of the interface between the thin layer and the substrate, and an isolation barrier for the component of said opposite conductivity type, the isolation barrier extending through the thin layer to the buried layer, regions of the device and of said one conductivity type extending beyond said at least one component, but contiguous with said at least one component, and said at least one component including at least one outer annular region of said opposite conductivity type, said annular region being disposed adjacent to the surface of the thin layer remote from the substrate, and being uniformly spaced from the combination of regions of said at least one component, and a significant resistance region between said at least one outer annular region and the combination of regions of said at least one component, said significant resistance region being a part of the component.

4,160,991
HIGH PERFORMANCE BIPOLAR DEVICE AND METHOD FOR MAKING SAME

Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia, Wappingers Falls, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,769
Int. Cl.[2] H01L 27/12
U.S. Cl. 357—49 8 Claims



1. A high performance semiconductor device with small emitter-base spacing comprising:

a silicon semiconductor body having regions of monocrystalline silicon isolated from one another by isolating regions;

a subcollector region within at least one of said regions of monocrystalline silicon;

first and second insulator layers over portions of said monocrystalline silicon;

a doped polycrystalline silicon layer over said second insulator layer with openings in said polycrystalline silicon layer to said monocrystalline surface only where an emitter contact and a collector reach-through are to be made;

a third insulator layer over said polycrystalline silicon layer;

a collector reach-through connecting the surface of said at least one regions of monocrystalline silicon with said subcollector region;

a base region spaced from said collector reach-through extending into said body from the surface of said body;

an emitter region within said base region extending from the surface of said body into said base region;

an emitter ohmic contact to said emitter region through said opening in said polycrystalline silicon layer;

a base ohmic contact composed of said doped polycrystalline silicon to said base region through openings in said first and second insulator layers;

said base contact being dielectrically isolated from and surrounding said emitter contact by said third insulator layer; and

a collector ohmic contact to said collector reach-through.

4,160,992
PLURAL SEMICONDUCTOR DEVICES MOUNTED BETWEEN PLURAL HEAT SINKS

Michael G. Adlerstein, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 14, 1977, Ser. No. 833,322
Int. Cl.[2] H01L 23/02, 29/48, 29/56
U.S. Cl. 357—81 5 Claims

1. A microwave diode device comprising in combination:

a metal base, said base having a lower threaded portion, an upper planar surface, and a flanged portion between said upper planar surface and said lower threaded portion;

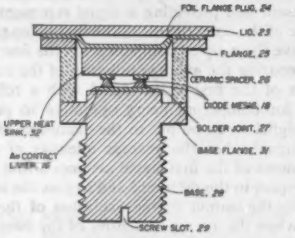
a layer of electrically and thermally conductive metal disposed upon said upper planar surface of said base;

a plurality of diode device bodies having a first surface in electrical and thermal contact with said first layer of electrically and thermally conductive metal;

a second layer of electrically and thermally conductive metal disposed upon a second surface of said plurality of diode device bodies;

a body of metal electrically and thermally in contact with a second surface of said plurality of diode device bodies, said body of metal having a larger volume than the volume of said plurality of diode device bodies;

an insulating spacer having a hollow cylindrical shape, one end of said spacer coupled to said flanged portion of said base;



a conducting annularly shaped flange coupled to the end of said spacer opposite said flanged portion;

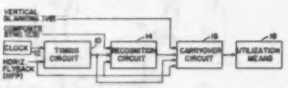
a flexible metal layer, center portions of said flexible metal layer being coupled thermally to said body of metal and outer portions of said flexible metal layer being coupled to said flange; and

a disc-shaped lid positioned over said flexible metal layer.

4,160,993
VIR LINE RECOGNITION SYSTEM

Richard G. Merrell, Darien, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 12, 1977, Ser. No. 859,631
Int. Cl.[2] H04N 9/12
U.S. Cl. 358—21 V 19 Claims



11. In a television receiver of the type having a line recognition system for identifying a predetermined horizontal scanning line of a transmitted television signal by counting horizontal scanning lines occurring subsequently of a reference point defined by the composite sync component of said television signal, the improvement comprising:

means for sampling preselected logical characteristics of said composite sync component at predetermined time intervals during each horizontal scanning line of said television signal; and

means responsive to said means for sampling for determining said reference point according to the logical characteristics of said sampled composite sync component.

4,160,994
LUMINANCE KEY AMPLIFIER

James A. Mendrala, San Fernando, Calif., assignor to Sonex International Corp., Burbank, Calif.

Continuation of Ser. No. 584,744, Jun. 7, 1975, abandoned, which is a continuation of Ser. No. 443,388, Feb. 19, 1974, abandoned. This application Aug. 26, 1977, Ser. No. 827,880
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—22 22 Claims

1. An arrangement for keying video signals comprising:

a first video signal source for providing a first video signal having a plurality of color components and which compo-

nents of said first video signal are present in various proportions relating to the presence of colors in the first video signal source and which represent a first visual image;

a second video signal source for providing a second video signal representing a second visual image; and

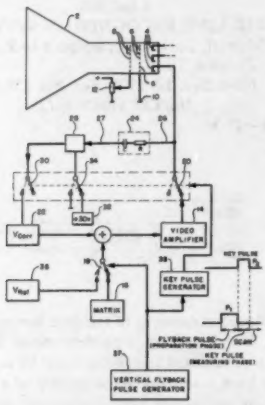
keying means coupling together substantially equal proportions of the components of said first video signal source to the extent that the components of said first video signal are present and providing a signal representative of the average of the components of the first video signal, means to receive the coupled components of the first video signal for comparing the average intensity of the coupled components of the first video signal with a reference, said means for comparing being operative to pass the first video signal to an output to the exclusion of the second video signal when the average intensity of the coupled components of the first signal assumes a first relationship with respect to the reference and to pass the second video signal to the output to the exclusion of the first video signal when the average intensity of the coupled components of the first video signal assume a second relationship with respect to the reference.

4,160,995

BIAS SETTING APPARATUS FOR USE WITH TELEVISION RECEIVERS

Erik A. Jensen, Baunehoj 22, 7600 Struer, Denmark

Filed Jan. 25, 1977, Ser. No. 762,368
Int. Cl.[2] H04N *9/20, 9/535*
U.S. Cl. 358—29 **10 Claims**



1. In a color television receiver having a display tube with a plurality of electron guns and a source of video signals for providing the proper signals to be applied to each of the electron guns, the improvement comprising:

timing means for defining selectively repeatable cathode voltage correction periods, each of said correction periods having a preparation phase followed by measuring and adjustment phase;

means individual to each electron gun for producing a respective correction voltage level;

means for producing a reference voltage level;

cathode voltage control means individual to each electron gun for selectively applying a composite test signal based on the sum of said respective correcting voltage level and said reference voltage level to the respective cathode during said preparation phase, said cathode voltage control means including reference switching means for applying a composite video signal based on the sum of said correcting voltage level and the signal from the source of video signals to the respective cathode between the occurrences of said preparation phase;

storage means individual to each electron gun and coupled to the respective cathode for sensing the voltage level of the respective cathode at the end of said preparation phase, during said preparation phase said cathode voltage control means is applying said composite test signal, and said storage means storing the sensed voltage subsequent to said preparation phase during said measuring and adjustment phase;

video switching means individual to each electron gun for disconnecting said cathode voltage control means from the respective cathode during said measuring and adjusting phase, thereby allowing the application of a biasing voltage to the respective cathode which is determined by the stored voltage sensed at the end of the immediately prior preparation phase; and

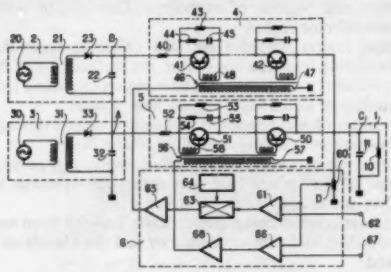
current sensing means individual to each electron gun for sensing the current of the respective cathode during said measuring and adjusting phase and for adjusting the correction voltage level of said correction voltage producing means as a function of the sensed current, such that the adjusted correction voltage applied to the respective cathode during normal operation subsequent to said measuring and adjustment phase corresponds to the cutoff bias of the respective electron gun.

4,160,996

SWITCHABLE HIGH VOLTAGE GENERATOR FOR PENETRATION-TYPE COLOR CRT

Jacques Nigra, Velizy Villacoublay, and Guy Vanthuyne, Arpajon, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Sep. 26, 1977, Ser. No. 836,392
Claims priority, application France, Oct. 1, 1976, 76 29692
Int. Cl.[2] H04N *9/27;* G05F *1/56;* H02J *1/00;* H01J *29/80*
U.S. Cl. 358—73 **3 Claims**



1. Very high voltage DC generator which can be switched between n levels for feeding a capacitative load, comprising a very high voltage power source capable of delivering at least two extreme levels of voltage straddling in the n DC voltage levels, at least two series assemblies of power transistors each connected to the power source via a current limiting resistor and to the load and defining respectively two opposite directions of conduction between the source and the load and a control circuit having a transistor control channel for each series assembly of transistors, means in each transistor control channel for elaborating an image signal of the error voltage between the voltage value at the terminals of the load and the required level, which causes, as a function of the direction of conduction of said assemblies, the transistors of one of the series assemblies to operate in the saturated state as a switching circuit, at least one of the control channels further comprising a modulator receiving the signal of an oscillator and ensuring the modulation thereof by said image signal to control the transistors of the corresponding series assembly in the saturated state and then in the non-saturated state, as a function of the value of said error voltage signal image, for ensuring opera-

tion of this assembly as a switching circuit and as a regulation circuit connected in series with the load.

4,160,997

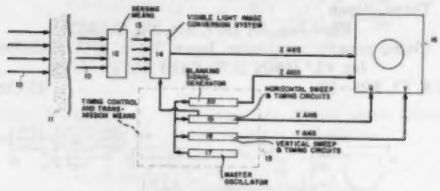
INTRAORAL FLUOROSCOPE

Robert Schwartz, 1271 Westfield Ave., Rahway, N.J. 07065

Continuation-in-part of Ser. No. 469,655, May 14, 1974, abandoned. This application May 12, 1976, Ser. No. 685,457

Int. Cl.[2] H04N *7/18, 5/32*

U.S. Cl. 358—93 **5 Claims**



1. An intraoral fluoroscope adapted for use with an electronic video display system comprising:

(a) sensing means for converting an invisible radiant energy image to a visible light image;

(b) a light image conversion system for converting a visible light image to an electrical video signal output comprising at least one charge coupled image sensor, said image conversion system being in visible light communication with said sensing means and said light image conversion system and sensing means adapted for insertion into the human mouth; and

(c) timing, control and transmission means electrically connecting said conversion system and said video display system and adapted to receive and transmit said video signal output from said conversion system to said video display system.

4,160,998

TELEVISION-BASED ALARM SYSTEM

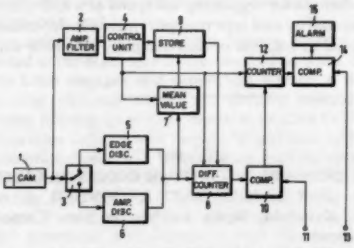
Gerhard Kamin, Traisa, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Fed. Rep. of Germany

Filed Apr. 15, 1977, Ser. No. 787,957

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617111

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—105 **10 Claims**



1. An alarm system for detecting a movement or change in the field of view supervised by a television camera, the system comprising a discriminator responsive to the video signal produced by the camera and adapted to produce a signal upon the occurrence of a predetermined characteristic in the picture content of the video signal, means for providing a succession of reference values each derived by adding the number of signals produced by the discriminator during a plurality of equal time intervals of predetermined duration and dividing the sum so formed by the number of time intervals over which the addition is performed, difference value means for generating difference values between the number of signals produced by the discriminator during each of a succession of time intervals, each time interval equal to the said predetermined duration, and the currently provided reference value, comparing means for comparing the difference values with a preselected first value to produce an event signal, and evaluating the event signal according to a predetermined criterion to produce an alarm with the criterion is satisfied.

4,160,999

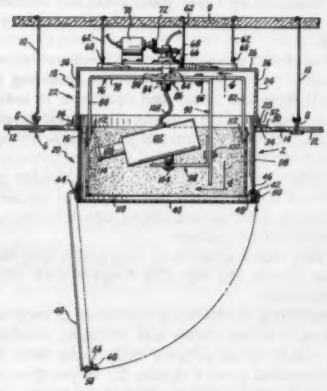
MOUNTING ARRANGEMENT FOR A TELEVISION MONITORING CAMERA

Joseph H. Claggett, 1017 E. Fourth Ave., Mitchell, S. Dak. 57301

Filed Apr. 5, 1978, Ser. No. 893,580

Int. Cl.[2] H04N *7/18;* **G03B** *17/56, 29/00*

U.S. Cl. 358—108 **10 Claims**



1. An arrangement for mounting a monitoring camera on a ceiling, including:

a housing including upper and lower portions, said lower housing portion including a partially transparent, cylindrical sidewall;

means for mounting said housing on said ceiling, with at least said lower housing portion extending downwardly from said ceiling;

a rotatable drive shaft mounted to extend into said housing from the upper end thereof;

motor means connected with said drive shaft for effecting rotational movement thereof;

bracket means mounted on the lower end of said drive shaft, within said housing;

an opaque cylinder carried by said bracket means and received within said partially transparent cylindrical sidewall of said lower housing portion, said opaque cylinder having a window therein; and

said bracket means being adaptable to mount a monitoring camera within said opaque cylinder, with its lens aimed through said window,

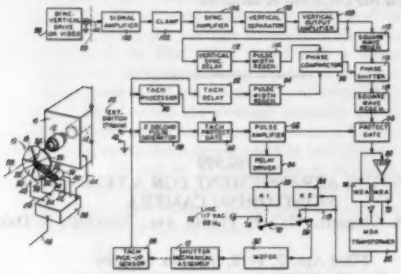
said bracket means, said opaque cylinder and said camera being movable as a unit upon rotation of said drive shaft by said motor means, and said partially transparent lower cylindrical sidewall and said opaque cylinder concealing said camera from view.

4,161,000

HIGH SPEED TELEVISION CAMERA CONTROL SYSTEM

Robert R. Cleveland, Kansas City, Mo., assignor to Video Systems Research, Inc., Kansas City, Mo.

Filed Oct. 28, 1977, Ser. No. 846,433
Int. Cl.[2] H04N *5/30, 7/18*
U.S. Cl. 358—225 **19 Claims**



18. An electrical circuit for controlling the operation of an electrical motor device in accordance with timing signals of the type produced by a sync-pulse generator used in a conventional television system for controlling picture image scanning, including:

detection circuit means adapted to be operably coupled with a source of said timing signals for receiving said timing signals from the latter, and operative to detect at least certain periodically recurring ones of said received timing signals comprising a train of picture synchronizing pulses each respectively associated with the commencement of scanning of a picture field by said television system, said detection circuit means including filter circuit means for selectively filtering said timing signals to detect said train of synchronizing pulses;

amplifying means adapted to be operably coupled with said motor device and operably coupled with said detection circuit means,

said amplifying means being operative to receive said train of synchronizing pulses and including amplification circuit means for amplifying each of the latter to produce synchronized power signals for delivery to said motor device for energizing the latter to operate,

the operating condition of said motor device being controlled in accordance with the frequency of said train of synchronizing pulses,

sensing means operably associated with said motor device for sensing said operating condition of the latter, and for producing control signals corresponding to said sensed condition;

actuatable pulse generation means having an output and being operative upon actuation thereof for generating an electrical pulse having a prescribed duration at said output thereof; and

digital logic circuit means having inputs thereto operably coupled with said sensing means, with said pulse generation means output, and with said detection circuit means, and having a gated output operably coupled with said amplifying means,

said logic circuit means being responsive to the receipt of said pulse from said pulse generation means upon actuation of the latter for coupling said detection circuit means with said amplifying means for said pulse duration to allow delivery of said synchronizing pulse train to the latter for energizing said motor device,

said logic circuit means functioning to maintain said coupling between said detection circuit means and said amplifying means after said pulse duration only so long as said control signals are being produced by said sensing means,

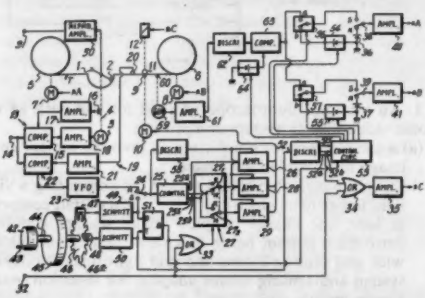
said logic circuit means functioning to uncouple said detection circuit means from said amplifying means upon failure of said sensing means to produce said control signals after said pulse duration.

4,161,001

VIDEO SIGNAL REPRODUCING APPARATUS WITH A MANUALLY CONTROLLED TRACK SEARCHING ARRANGEMENT

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 28, 1977, Ser. No. 810,862
Claims priority, application Japan, Jul. 5, 1976, 51-79705
Int. Cl.[2] H04N *5/78*; G11B *27/02, 15/46*
U.S. Cl. 360—10 **15 Claims**



1. Apparatus for reproducing video signals recorded in successive parallel tracks on a magnetic tape, said tracks being disposed at an angle with respect to the direction of advancement of the tape, comprising:

magnetic signal sensing means for reproducing the video signals recorded in each of said tracks upon positioning of said tape for scanning of the respective track by said sensing means;

tape transport means for transporting said tape relative to said sensing means and thereby causing the latter to scan said tracks in succession for reproducing the video signals respectively recorded therein at a rate dependent on the speed at which the tape is transported; and

track searching means including a manually rotatable wheel, and control means sensing changes in the rotational position of said wheel and providing signals in response to such changes for regulating the speed at which the tape is transported by said tape transport means in dependence on the speed of rotation of said manually rotatable wheel.

4,161,002

POWER CONSERVING MOTOR CONTROL CIRCUIT FOR A VIDEO TAPE RECORDER

Isao Saito, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,034
Claims priority, application Japan, Jan. 8, 1977, 52-497[U]; Jan. 8, 1977, 52-499[U]
Int. Cl.[2] G11B *21/02*
U.S. Cl. 360—75 **13 Claims**

5. A video tape recorder comprising:

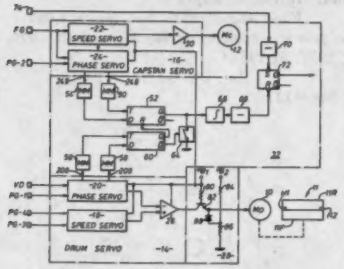
a rotary magnetic head;

a motor for rotating said rotary magnetic head;

servo means for controlling said motor and thereby said rotary magnetic head to rotate at a predetermined speed;

non-servo control means for controlling said motor and

thereby said rotary magnetic head to rotate at an uncontrolled speed slower than said predetermined speed; and



means for selectively connecting one of said servo means and said non-servo control means to said motor.

4,161,003

DEVICE FOR HOLDING A ROTATABLE RECORD DISC

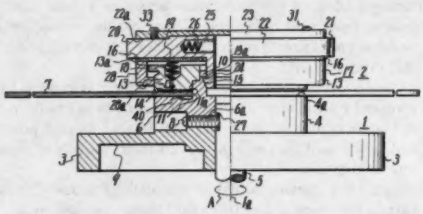
Yutaka Ichiyanagi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,425

Claims priority, application Japan, Apr. 20, 1977, 52-49707[U]

Int. Cl.[2] G11B *19/00, 5/82*

U.S. Cl. 360—99 **11 Claims**



1. A device for holding a rotatable record disc having a central opening therethrough, comprising:

a support base rotatable about a central axis and including means defining a supporting surface normal to said axis and against which one side of the record disc may engage, means engageable in said central opening of the disc, when the latter engages said supporting surface, for concentrically aligning the disc with said axis, and first locking means; and

clamp means including a clamp housing adapted to be disposed at the other side of the record disc when one side of the latter engages said supporting surface, a plurality of locking elements which are slidably mounted in said clamp housing so as to be movable relative to the latter in directions radially with respect to said axis, locking claws extending from inner ends of said locking elements and being engageable with said first locking means upon outwardly radial movement of said locking elements, biasing means for urging said locking elements in outwardly radial directions with respect to said axis for maintaining engagement of said claws with said first locking means and thereby securing said clamp housing against movement away from said base with said clamp housing disposed at said other side of the record disc, said locking elements having outer portions exposed at diametrically opposite sides of said clamp housing for allowing simultaneous manual urging thereof toward each other to provide release of said locking claws from said first locking means and thereby permit removal of said clamp means from said base, a clamp base extending from said clamp housing for engaging against said other side of the record disc and being movable relative to said clamp housing in the direction of said axis, and resilient means urging said clamp base relative to said clamp housing in the direction of said axis toward said other side of the record disc for clamping the latter between said clamp base and said supporting surface.

4,161,004

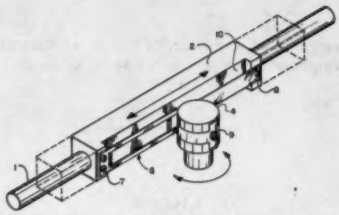
HEAD POSITIONING MECHANISM FOR RECORDING/PLAYBACK MACHINE

Warren L. Dalziel, Monte Sereno, Calif., assignor to Shugart Associates, Sunnyvale, Calif.

Filed Apr. 5, 1977, Ser. No. 784,905

Int. Cl.[2] G11B *5/56*

U.S. Cl. 360—106 **21 Claims**



1. A positioning mechanism for a read/write head of a recording/playback machine of the type utilizing discs upon which information is magnetically stored, said positioning mechanism comprising:

a rotary drive motor having an armature shaft;

a capstan affixed to the armature shaft of said rotary drive motor for rotation therewith when the motor is actuated;

a carriage means adapted to carry a magnetic read/write head;

a guide means connected to said carriage means to define a path of movement therefor, said path being parallel to a line generally tangent to said capstan;

a flexible, nonstretchable band means having opposite ends, said band means being wound about said capstan and fixed thereto with the opposite end portions of said band extending from said capstan substantially along said line tangent; and

attachment means for attaching respective ends of said band means to spaced-apart locations on said carriage means, said attachment means including resilient means for attaching one end of said band to said carriage and for applying a biasing force thereto which tends to maintain a predetermined tension in said band whereby upon an incremental angular rotation of said armature shaft, one end portion of said band is wound off of said capstan and the opposite end portion of said band is simultaneously wound onto said capstan, thereby causing said carriage means to move along said path.

4,161,005

MAGNETIC HEADS AND FIXING MATERIAL WITH AN ADDITIONAL FILLER OF MOS_2

Hiroaki Kato, Machida, and Junji Hamana, Chichibu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1977, Ser. No. 845,637

Claims priority, application Japan, Nov. 1, 1976, 51-131507; Feb. 21, 1977, 52-17900

Int. Cl.[2] G11B *5/105*

U.S. Cl. 360—129 **9 Claims**

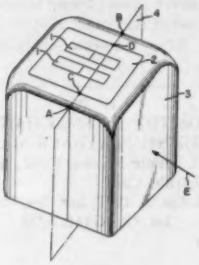
1. A magnetic head comprising:

a magnetic core having a sliding surface on which a magnetic tape moves;

a casing for enclosing said magnetic core; and

a fixing material used to secure said magnetic core within

said casing, said fixing material comprising not less than 19.5% by weight of a resin having adhesiveness, 40–80%



by weight of a fine powder of SiO_2 as a filter and 0.5–50% by weight of a fine powder of MoS_2 as another filler.

4,161,006

TAPE CASSETTE-EJECTING INHIBITING DEVICE FOR A MAGNETIC TAPE APPARATUS

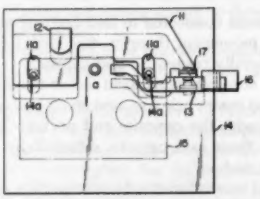
Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1978, Ser. No. 874,058

Claims priority, application Japan, Feb. 14, 1977, 52/16425[U]

Int. Cl.[2] G11B *15/00, 23/00*

U.S. Cl. 360—137 **2 Claims**



1. A tape cassette-ejecting device for a magnetic tape apparatus utilizing a cassette having a magnetic tape received therein, said device comprising a substrate; a magnetic head-supporting plate extending over the substrate and slidable between first and second positions; a magnetic head mounted on the magnetic head-supporting plate for joint movement therewith, said magnetic head being removed from the magnetic tape in the cassette when said supporting plate is in said first position and being in contact with the magnetic tape when said supporting plate is in said second position; an eject lever mounted on the magnetic head-supporting plate below the cassette for joint movement with said plate and being rotatable in a direction perpendicular to that in which the magnetic head-supporting plate is slidable; and an eject control button for rotating said eject lever movable in a direction perpendicular to that in which the magnetic tape-supporting plate is slidable, said eject control button being located such that when the magnetic head-supporting plate is in said first position movement of the eject control button will cause it to contact one end of the eject lever and rotate same so that the other end of said eject lever will push up the cassette, and when the magnetic head-supporting plate is in said second position movement of the eject control button will not cause it to contact said one end of the eject lever.

4,161,007

MAGNETIC TAPE CASSETTE APPARATUS

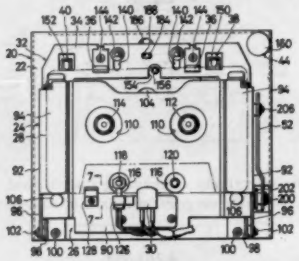
Tamotsu Haraguchi, Musashino, Japan, assignor to TEAC Corporation, Musashino, Japan

Filed Aug. 2, 1977, Ser. No. 821,094

Claims priority, application Japan, Aug. 16, 1976, 51-97530; Aug. 16, 1976, 51-97531

Int. Cl.[2] G11B *23/04*

U.S. Cl. 360—137 **10 Claims**



1. In a magnetic tape cassette apparatus of the type having a cassette cradle pivoted at one end for movement between a first position for loading and unloading a tape cassette into and from the cradle through the other end thereof and a second position for running the tape within the tape cassette with respect to a magnetic head fixedly mounted on the cradle at said one end thereof, the improvement comprising:

a carriage adapted for movement between a third position remote from said other end of said cradle in said second position and a fourth position adjacent to said other end of said cradle in said second position;

electrical switch means mounted on said carriage so as to be actuated by the tape cassette carried by said cradle when the latter is moved from said first to said second position and when said carriage is moved from said third to said fourth position;

carriage shift means actuable manually for moving said carriage from said fourth to said third position; and

ejector means responsive to the actuation of said carriage shift means for moving said cradle from said second to said first position, the motion from said second to said first position being delayed until at least after said carriage has begun to move from said fourth to said third position;

said carriage shift means and said ejector means being operatively associated with each other so that upon movement of said cradle from said first to said second position by direct manual actuation thereof, said carriage is moved from said third to said fourth position, said cradle reaching said second position before said carriage reaches said fourth position.

4,161,008

PROTECTION CIRCUITRY FOR CABLE TRANSMISSION SYSTEM

Detlef Zimmermann; Sayman F. Demircioglu, and Jindrich Kugler, all of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 26, 1978, Ser. No. 900,264

Int. Cl.[2] H02H *9/04*

U.S. Cl. 361—56 **10 Claims**

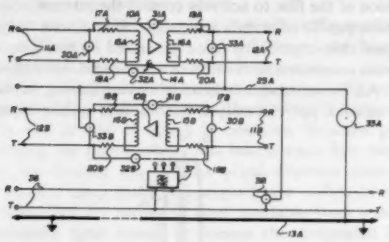
1. In a cable transmission system comprising:

a multipaired cable which includes a core having a plurality of cable pairs, and a conductive sheath surrounding said core;

a plurality of line powered amplifiers at discrete locations along the system, each connected in series with an individual cable pair through a pair of input and output terminals;

a plurality of negative impedance switching devices connecting each of said terminals to a common bus;

characterized by a further negative impedance switching device having a switching voltage greater than that of said



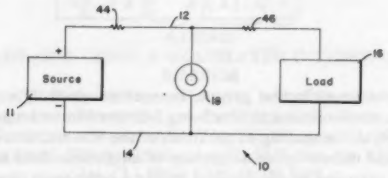
plurality of devices, connected between the common bus and the conductive sheath.

4,161,009

AUTOMATIC CROWBAR AND ARC QUENCHING SYSTEM

Robin J. Harvey, Thousand Oaks, and Michael A. Lutz, Mountain View, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 13, 1978, Ser. No. 896,076
Int. Cl.[2] H02H 3/24
U.S. Cl. 361—56 **7 Claims**



1. An automatic arc quenching system comprising:

a source of voltage connected to first and second buses;

a device connected to both said first and second buses, said device having first and second conductors therein respectively connected to said first and second buses, said device being such that arcing may occur between said first and second conductors; and

a crossed-field switch device connected between said first and second buses, said crossed-field switch device being conditioned so that is is nonconductive at normal bus voltage and is conductive when an arc occurs between said conductors in said device so that when an arc occurs between said conductors in said device, said crossed-field switch device provides a parallel current path to the arc so that arc energy is reduced.

4,161,010

COMMUTATION SENSOR CIRCUIT FOR A DC-TO-DC SILICON CONTROLLED RECTIFIER (SCR) CHOPPER CIRCUIT

Stanley L. Mann, New Berlin, and Charles E. Rettig, Brookfield, both of Wis., assignors to Litton Industrial Products, Inc., Milwaukee, Wis.

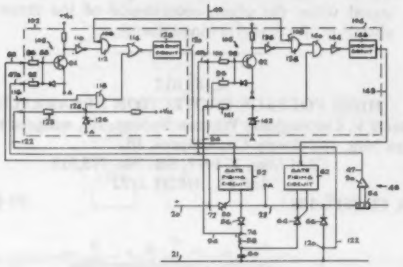
Filed Sep. 15, 1977, Ser. No. 833,537
Int. Cl.[2] H02H 3/28
U.S. Cl. 361—79 **10 Claims**

1. A commutation sensor circuit for a DC-to-DC chopper circuit connected between a source of applied DC voltage and regulated output where the chopper circuit receives a command signal representative of a desired regulated output and where the chopper circuit includes a controller that compares the command signal to the actual regulated output, the commutation sensor circuit comprising:

(a) a circuit common providing a circuit reference of known electrical potential,

(b) first sensor means referenced to said circuit common sensing the applied DC voltage as the available commutation voltage,

(c) first control means comparing said available commutation voltage to the actual regulated output and enabling the chopper circuit when said available commutation voltage is sufficient to commutate the chopper circuit,



(d) second sensor means referenced to said circuit common sensing the commutation voltage in the chopper circuit after said first control means enables the chopper circuit and the controller initiates the chopper cycle, and

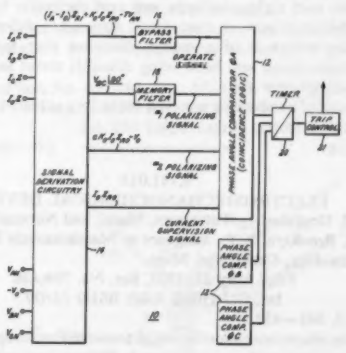
(e) second control means comparing said chopper circuit commutation voltage to the actual output current and initiating commutation by the chopper circuit at least when said output current equals the maximum commutating ability of the chopper circuit thereby overriding the controller of the chopper circuit.

4,161,011

GROUND DISTANCE RELAY EMPLOYING PHASE COMPARATOR MEASUREMENT

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 21, 1978, Ser. No. 879,653
Int. Cl.[2] H02H 3/26, 7/26
U.S. Cl. 361—80 **18 Claims**



9. In a ground distance protective relay for a transmission line in an a-c power system, the relay circuit including phase angle comparator operation wherein AND circuit means is responsive to phase coincidence of a plurality of input signals thereto, one input signal being an operating signal and another input signal being a first polarizing signal, the operating signal being related to the sum of (1) the product of transmission line current and a replica impedance of the transmission line and (2) transmission line voltage, the polarizing signal being related to

transmission line voltage, TIMER circuit means responsive to an output signal of the AND circuit means for producing a TIMER output signal when the phase coincidence of the plurality of signals is of a predetermined duration, wherein the improvement comprises:

means for providing a second polarizing signal, said second polarizing signal being related to the zero sequence voltage of the transmission line at the relay; and

wherein the AND circuit means is responsive to the phase coincidence of: (1) the operating signal, (2) the first polarizing signal, and (3) the second polarizing signal, the TIMER circuit means producing said TIMER output signal when the phase coincidence of the three input signals is of a predetermined duration.

4,161,012

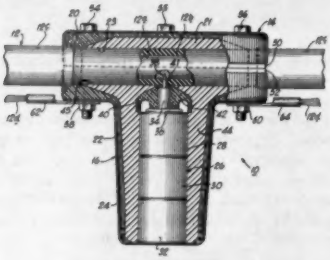
HIGH VOLTAGE PROTECTION APPARATUS

Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Mar. 2, 1977, Ser. No. 773,511

Int. Cl.[2] H02H *3/22*

U.S. Cl. 361—128 **57 Claims**



1. A surge arrester for connecting to a component of an electrical power circuit comprising

arrester components including a valve element formed by onee or more valve blocks,

a formed dielectric body for housing said arrester components, said dielectric body comprising means for forming a substantially air-free interface encircling said arrester components when said arrester components are inserted into said dielectric body and said dielectric body being fabricated from an elastomeric material to define a central bore which is of a smaller diameter than said arrester components, said bore being dilatable about said arrester components, and

a cover of conductive material encircling at least a portion of said dielectric body.

4,161,013

ELECTROMECHANOCHEMICAL DEVICE

Alan J. Grodzinsky, Watertown, Mass., and Norman A. Shoenfeld, Brooklyn, N.Y., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 23, 1977, Ser. No. 799,486

Int. Cl.[2] H01G *9/00*; B01D *13/00*

U.S. Cl. 361—433 **37 Claims**

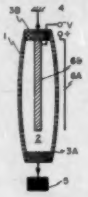
1. An electromechanochemical transductive coupler for use in connection with an aqueous electrolyte containing mobile ions that comprises, in combination:

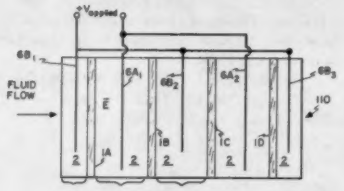
a deformable polyelectrolyte film comprising fixed charge molecular groups, which film, when immersed in an aqueous electrolyte containing mobile ions which enter into the film, is operable to provide a force that is a function of the structural configuration of the matrix of the film, said structural configuration being a function of the internal concentration profile of mobile ions inside the polyelectrolyte film, which internal concentration profile is a function of an electric field applied across the thickness dimension thereof;

means to apply an electric field across the thickness dimension of the film to actively control the internal concentration profile of mobile ions inside the polyelectrolyte film and thus control the force generated by the film; and

means connected to the film to couple said force therefrom.

25. An electromechanochemical device having, in combination: porous polyelectrolyte fibrous film means comprising





fixed charge molecular groups; an aqueous electrolyte comprising mobile ions, said film being immersed in said aqueous electrolyte, the spacing of the fibers of the film and hence the pore size thereof being a function of an electric field in the region occupied by the film and having a component directed across the thickness dimension of the film; and electrical means to apply an electric field across the thickness dimension of the film to actively control in a smooth, variable fashion, the spacing of the fibers of the film.

4,161,014

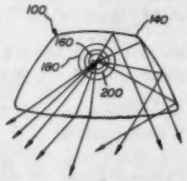
LUMINAIRE HAVING A CONFIGURED INTERFERENCE MIRROR AND REFLECTOR

Thomas W. Dey, Rochester, N.Y.; James D. Howe, St. Louis, Mo., and Eugene C. Letter, Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 786,710, Apr. 11, 1977, abandoned, and a continuation-in-part of Ser. No. 716,415, Aug. 23, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 821,044

Int. Cl.[2] F21L *00/00*; F21M *3/04*

U.S. Cl. 362—263 **38 Claims**



1. A luminaire fixture of high illumination efficiency structured to house a monochromatic light source and capable to control the direction of light emittable from such light source

to illuminate a task area in a controlled intensified light pattern, comprising:

receptacle means for defining a designated lamp space and capable to receive a monochromatic light source to occupy the designated lamp space;

reflector means including a reflective surface disposed about the designated lamp space for reflecting light from the reflective surface toward the task area; and

multilayer interference mirror means geometrically configured to define an interference film surface the cross section and profile of which is nonlinear between points defining the extremities of the interference film surface, the interference film surface being disposed about the designated lamp space and supporting a multilayer interference film for receiving light emittable from a monochromatic light source to occupy the designated lamp space, and light to be reflected by the reflector means receivable directly from a monochromatic light source to occupy the designated lamp space and light reflected from the multilayer interference film, for passage through the geometrically configured multilayer interference mirror means, of that light received at predetermined angles of incidence into controlled angular directions and to reflect the light received at other than the predetermined angles of incidence to thereby illuminate the task area in a controlled intensified light pattern.

4,161,015

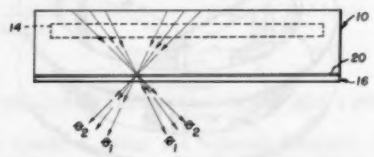
LUMINAIRE USING A MULTILAYER INTERFERENCE MIRROR

Thomas W. Dey, and Eugene C. Letter, both of Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 716,409, Aug. 23, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 821,129

Int. Cl.[2] F21V *9/00*; G02B *5/28*

U.S. Cl. 362—263 **6 Claims**



1. A luminaire assembly of high illumination efficiency for controlling the direction of light to illuminate a task area in a controlled intensified light pattern, comprising:

reflector means;

light source means disposed within said reflector means for emitting monochromatic light; and

multilayer interference mirror means disposed on a supporting substrate for receiving light emitted directly from said light source means and light reflected from said reflector means for passing therethrough light received at predetermined angles of incidence and for reflecting other light emitted from the light source means and reflected from the reflector means which other light is thereafter again received by the multilayer interference mirror means after being reflected by said reflector means for passage through the multilayer interference mirror means at the predetermined angles of incidence for said multilayer interference mirror means to intensify by controlling the angular direction of light passing therethrough for passage of said light into a control range to illuminate the task area in a controlled intensified light pattern.

4,161,016

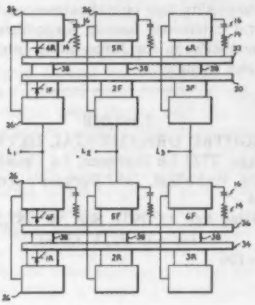
SEMICONDUCTOR AND HEAT SINK ASSEMBLY

Norman E. Born, and Martin A. Halttunen, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 12, 1977, Ser. No. 859,837

Int. Cl.[2] H05K *7/20*

U.S. Cl. 361—388 **4 Claims**



1. A semiconductor and heat sink assembly having first and second groups of semiconductors, each semiconductor having an anode terminal and a cathode terminal, said first group being active and said second group being inactive in a first mode of circuit operation and said second group being active with said first group being inactive in a second mode of circuit operation, said assembly comprising:

(a) a first electrically conductive heat sink unit joining the anode terminals of a first portion of the semiconductors of said first group and the cathode terminals of a first portion of the semiconductors of said second group;

(b) a second electrically conductive heat sink unit joining the cathode terminals of a second portion of the semiconductors of said first group and the anode terminals of a second portion of the semiconductors of said second group; and,

(c) a plurality of additional heat sink members one of which is connected to the free electrode terminals of each of the semiconductors of said first and second groups.

4,161,017

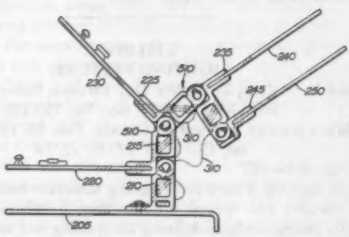
METHOD AND APPARATUS FOR MOUNTING PRINTED CIRCUIT BOARDS

Perry H. Pierce, and Dan L. Prendergast, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 622,792, Oct. 15, 1975. This application Aug. 8, 1977, Ser. No. 822,860

Int. Cl.[2] H02B *1/02*

U.S. Cl. 361—412 **6 Claims**



1. An interlocking hinge comprising:

a body;

a projection extending perpendicular to the longitudinal axis and adjacent to a first longitudinal end of said body, said

projection having one or more eccentric portions with respect to the central axis thereof;

engaging means adjacent to a second longitudinal end of said body for freely engaging an object of a shape corresponding to that of said projection in one relative position and for locking together therewith in a second relative position; and

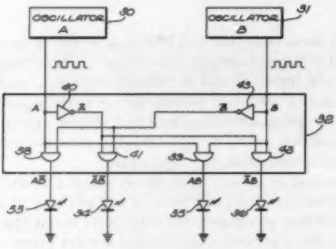
attachment means connected to the body of said hinge for attaching an external member thereto, said attachment means comprising two lateral extensions from said body, said lateral extensions having force-fitting means interposed therebetween for force-fitting into an opening in said external member.

4,161,018

LIGHTED ORNAMENTAL DEVICES

James B. Briggs, 1722 La Barranca, La Canada, Calif. 91011, and Flake M. Wakefield, 2852 Burkshire Ave., Los Angeles, Calif. 90064

Filed Apr. 13, 1977, Ser. No. 787,289
Int. Cl.[2] F21V *33/00*
U.S. Cl. 362—104 **13 Claims**



1. An ornamental device having a plurality of light sources illuminated in a random or substantially random fashion, the improvement comprising

plural light sources disposed in a pattern on the face of the device, and

circuit means mounted on the device forming a self-contained ornamental/circuit assembly for automatically controlling energization of the light sources one at a time by internal electrical generation of energizing signals, said circuit means comprising oscillator means and means connecting the oscillator means with logic means, said logic means comprising shift register means having feedback from a plurality of stages thereof to its data input through Exclusive Or means for generating said energizing signals in a random or substantially random manner, and having a plurality of outputs connected to decoding means, said oscillator means being connected to another input of said shift register means and said sources being connected to said logic means.

4,161,019

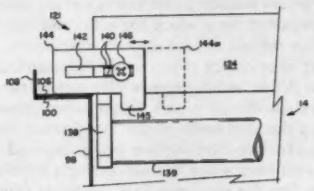
LIGHTING FIXTURE

Gerard E. Mulvey, 57 Mobile Dr., Toronto, Ontario, Canada

Filed May 2, 1977, Ser. No. 793,132
Claims priority, application Canada, Feb. 25, 1977, 272726
Int. Cl.[2] F21V *21/34, 21/14*
U.S. Cl. 362—147 **13 Claims**

1. A lighting fixture for a ceiling structure including mutually parallel and spaced apart ceiling members having upwardly facing surfaces defining an opening and wherein a said lighting fixture may be removably positioned between said ceiling members and supported in such position, said lighting fixture comprising a generally rectangular housing having mutually spaced apart side walls, and a bottom wall releaseably attached thereto;

arms retractably mounted on said side walls for movement between extended positions for disposition on said upwardly facing surfaces of said ceiling members and retracted positions so that said lighting fixture can be moved vertically between said ceiling members, and,



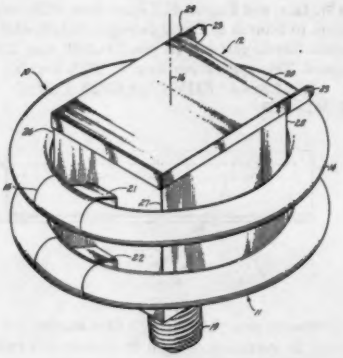
a handle portion projecting downwardly from each said arm and extending below said bottom wall.

4,161,020

FLUORESCENT LAMPHOLDER ASSEMBLY FOR CIRCLINE LAMP

Jack V. Miller, Sierra Madre, Calif., assignor to Killerwatt Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 770,753, Feb. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 734,263, Oct. 20, 1976, abandoned, and Ser. No. 734,264, Oct. 20, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,317
Int. Cl.[2] F21S *5/00*
U.S. Cl. 362—216 **37 Claims**



1. A fluorescent lampholder assembly for receiving a circline lamp comprising:

a block-shaped housing having a smaller cross section than the circline lamp, the housing having four edges parallel to the axis of the circline lamp when installed, the diagonal distance between the edges being almost as large as the diameter of the circline lamp;

a lampholder-socket having a first portion lying inside the housing, a second portion lying outside the housing, and terminals extending through the first and second portions, the terminals being adapted to engage the plug pins of the circline lamp outside the housing when the circline lamp surrounds the housing and being adapted to receive connecting wires of components inside the housing; and

means extending from the housing in spaced relationship from the lampholder-socket for supporting the circline lamp together with the lampholder-socket when the pins of the circline lamp engage the terminals.

4,161,021
LOW ENERGY DECORATIVE LIGHT BULB DISPLAYS

Benjamin B. George, Jr., 12751 Browning, Santa Ana, Calif. 92705

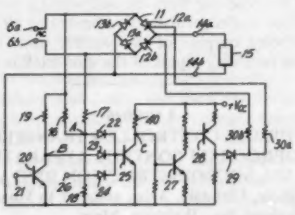
Filed Aug. 29, 1977, Ser. No. 828,403
Int. Cl.[2] F21P 1/00
U.S. Cl. 362—252 7 Claims

1. A decorative light bulb assembly comprising:
- a transparent bulb with surrounding interior reflective surfaces and a narrow base opening at one end;
- a base structure adapted to be permanently affixed to said bulb at said base opening and containing opposing base terminals for supplying electrical power from a lamp socket;
- a lamp string consisting of a plurality of unbased miniature lamps with elongated flexible wire leads connected end-to-end in series, said lamp string having a length substantially longer than the distance between said base terminals and the opposite end of said bulb and having its two ends electrically coupled to the opposing base terminals with one end affixed to the base; and,
- twisting means for supporting a portion of said lamp string near said opposite end of said bulb at a point remote from the base for imparting a rotary spring-like tension that opens folds in said lamp string to distribute said lamps within said bulb at locations substantially displaced from the central axis and inner reflecting bulb surfaces, thereby producing myriad reflective images of said lamps within said bulb.

4,161,022
CONTROLLABLE RECTIFIER CIRCUIT FOR A POWER SUPPLY

Kenichi Kanazawa, Atsugi, and Nobuyuki Takahashi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 7, 1978, Ser. No. 931,765
Claims priority, application Japan, Aug. 9, 1977, 52-95231
Int. Cl.[2] H02M 7/155
U.S. Cl. 363—88 10 Claims

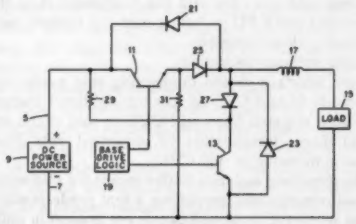


1. A controllable rectifier circuit for selectively producing a half-wave or a full-wave rectified signal, comprising:
- a pair of input terminals adapted to be supplied with an AC signal;
- a bridge rectifier coupled to said pair of input terminals and including a pair of output terminals across which a rectified AC signal is produced, said bridge rectifier comprising a first current path including a switchable rectifier for conducting positive half cycles of said AC signal and a second current path including a switchable rectifier for conducting negative half cycles of said AC signal;
- means coupled to said pair of input terminals for receiving, in sequence, reduced amplitude versions of said positive and negative half cycles of said AC signal to produce an output pulse when the reduced amplitude of a respective one of said positive and negative half cycles is less than a predetermined level;
- means for selectively supplying one of said half cycles of said AC signal to said last-mentioned pulse producing means to prevent said pulse producing means from producing an output pulse during said one half cycle, and thereby produce an output pulse during the beginning and ending portions of each of said other half cycle; and
- means for supplying the output pulses produced by said pulse producing means to each of said switchable rectifiers, whereby said bridge rectifier rectifies both half cycles of said AC signal when said one half cycle is not supplied to said pulse producing means, and said bridge rectifier rectifies only said other half cycle of said AC signal when said one half cycle is supplied to said pulse producing means.

4,161,023
UP-AND-DOWN CHOPPER CIRCUIT

Jacques R. Goffeau, Hermosa Beach, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 7, 1977, Ser. No. 831,302
Int. Cl.[2] H02M 7/00
U.S. Cl. 363—124 3 Claims



1. In a Darlington transistor type "up-and-down" chopper for regulating a DC voltage from a source supplying energy to an energy storing load in a "down" operating mode and alternately transferring energy stored in said load to said source in an "up" operating mode including first and second Darlington transistors connected in a series-shunt relationship, respectively, between said source and said load, an inductor connected in immediate series with said load for smoothing the chopped current flowing through said load, a base drive logic circuit means for supplying base drive signals to the base electrodes of said first and second transistors to switch said first transistor "on" and "off" at a selected rate when said chopper is operating in said down mode and switching said second transistor "on" and "off" at a selected rate when said chopper is operating in said up mode, a first free-wheeling diode connected in parallel with the series connected inductor and load for maintaining conduction of current through said load in the down mode during the time said first transistor is switched "off" and a second free-wheeling diode connected between said source and said series connected inductor and load for conducting current from said load to said source in said up mode during the time said second transistor is switched "off", the improvement comprising:
- a first charging circuit means for applying the DC source voltage between the collector and emitter electrodes of said second transistor to charge the inter-electrode capaci-

tance of said second transistor to prevent conduction through said second transistor when said first transistor is turned "on", and

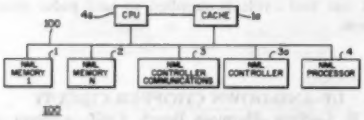
a second charging circuit means for applying the DC source voltage between the collector and emitter electrodes of said first transistor to charge the inter-electrode capacitance of said first transistor to prevent conduction through said first transistor when said second transistor is turned "on".

4,161,024

PRIVATE CACHE-TO-CPU INTERFACE IN A BUS ORIENTED DATA PROCESSING SYSTEM

Thomas F. Joyce, Burlington, and Thomas O. Holtey, Newton Lower Falls, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1977, Ser. No. 863,097
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **3 Claims**



1. A data processing system comprising:

a system bus;

a plurality of system units including a main memory, a cache memory, a central processing unit (CPU), and a communications controller all connected in parallel to said system bus, said controller operating to supervise interconnection between said units via said bus to transfer data therebetween and said CPU including memory request means for generating data requests;

said cache memory including:

private interface means connecting said cache memory directly to said CPU for permitting direct transmission of data requests from said CPU to said cache memory and direct transmission of requested data from said cache memory to said CPU;

cache directory and data buffer means for evaluating said data requests and generating a first predetermined output when the requested data is not present in said cache memory; and

system bus interface means connecting said cache memory to said system bus for obtaining CPU requested data not found in said cache memory from said main memory via said system bus in response to said first predetermined output from said cache directory and data buffer means.

4,161,025

INFORMATION PROCESSING SYSTEM

Jean-Jacques Dahy, Aubergenville, and Maurice Hubert, Versailles, both of France, assignors to Compagnie Internationale pour l'Informatique, Louveciennes, France

Continuation of Ser. No. 525,638, Nov. 20, 1974, abandoned.
This application Apr. 12, 1977, Ser. No. 786,895
Claims priority, application France, Dec. 4, 1973, 73 43137
Int. Cl.[2] G06F *3/04*
U.S. Cl. 364—200 **3 Claims**

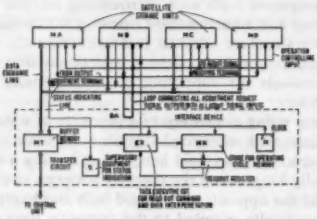
1. An interface device for controlling data exchanges through a data exchange link comprising a data exchange transfer circuit between a central processor unit and a plurality of individually selectable satellite units each of which operates according to an operative cycle of its own for execution of an exchange,

each operative cycle of a satellite unit comprising a fixed plurality of sequential steps, each step being executed according to an internal chronometry of the satellite unit and the initiation of each successive step of the sequence being authorized from the reception after request of an acquit signal of the execution of the preceding step of the sequence by the satellite unit,

each satellite unit having an input/output data connection to the said data exchange transfer circuit, an operative cycle control input controlling each time it is activated the execution of a corresponding step of the operative cycle of the satellite unit, an acquit signal requesting output activated each time an operative step of the cycle has been executed in the satellite unit and an acquit signal receiving input the activation of which authorizes the satellite unit to proceed to the execution of the next step of its operative cycle,

said interface device comprising the combination of:

means storing at locations thereof addressable from the central processor unit sequences of data, each sequence describing a step by step record of the operative cycle of a particular one of the satellite units and each data of the sequence describing the nature of the step to be executed by the satellite unit and the time instant at which the execution of this step may occur in the satellite unit,



read-out data register means coupled to the said storage means to successively store the data words read out from said storage means,

data read-out command and read-out data decoder means having a storage means address input activable by the central processor unit, a data input connected to the said read-out data register means, a satellite control signal delivering output connected to the operative cycle control inputs of the satellite units, and having a further output activated concurrently to the said satellite control signal and connected to an unblocking input of the said data exchange transfer circuit said data read-out command and read-out data decoder means further having a clock input,

local clock means having an output connected to said clock input of the said data read-out command and data decoder means for defining the time instants at which the said satellite control signals are applied to the said satellite control signal delivering output and at which data are read-out from the said storing means, and,

conductor means permanently connecting all acquit signal requesting outputs of the satellite units to all acquit signal receiving inputs of the said satellite units.

4,161,026

HARDWARE CONTROLLED TRANSFERS TO MICROPROGRAM CONTROL APPARATUS AND RETURN VIA MICROINSTRUCTION RESTART CODES

John E. Wilhite, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 22, 1977, Ser. No. 853,981
Int. Cl.[2] G06F *9/14, 9/20, 9/19, 13/08*
U.S. Cl. 364—200 **26 Claims**

1. A data processing system including a microprogrammable data processing unit for performing data manipulations under the control of instructions wherein the processing of instructions proceed in a pipelined fashion wherein each instruction is

processed in a number of different phases of operation to completion, said data processing unit comprising:

a plurality of registers for storing instructions to be processed, each instruction including a multibit operation code;

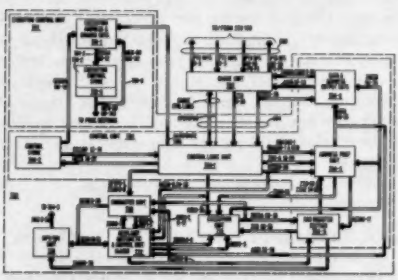
a first addressable control store coupled to a first one of said plurality of registers for receiving signals corresponding to said multibit operation code of an instruction to be processed, said first control store including a plurality of locations, each for storing a word including at least a multibit control sequence code having less bits than said operation code and an address, said control sequence code specifying one of a number of hardwired control sequences and said address identifying a first microinstruction of a different one of a plurality of execution sequences;

a cycled addressable second control store including a plurality of locations for storing at least one microinstruction of a different one of said plurality of execution sequences;

an address register connected to receive said address from said first control store and connected to said second control store for read out of the microinstruction contents of a location during a cycle of operation;

an output register connected to said second control store for temporarily storing said microinstruction contents read out during said cycle of operation;

hardwired control state sequencing means coupled to said first control store including sequence decoder circuit



means for decoding said control sequence codes, said hardwired control sequencing means for generating different sequences of control signals for defining the different operations to be performed during a first one of said phases of operation for each instruction, said hardwired control sequencing means, being conditioned by each control sequence code within a certain class read out in response to the operation code of an instruction being processed, for generating a predetermined one of said different sequences of control signals, for performing said operations during said first one of said phases of said instruction, for transferring said address into said address register, for continued processing of said instruction under the control of the specified one of said plurality of execution sequences, and for placing said sequencing means in a predetermined state, said specified execution sequence including a microinstruction containing a restart code bit pattern; and,

decoder circuit means coupled to said hardwired control state sequencing means and to said output register, said decoder circuit means being operative upon the read out of said microinstruction restart code pattern from said second control store into said output register to generate signals for switching said hardwired control state sequencing means from said predetermined state to another state to continue instruction processing in said pipelined fashion.

4,161,027

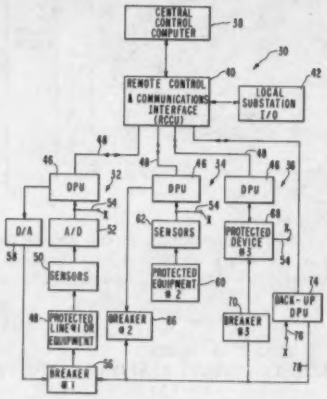
DIGITAL PROTECTION SYSTEM FOR TRANSMISSION LINES AND ASSOCIATED POWER EQUIPMENT

Billy D. Russell, Bryan, Tex., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 4, 1976, Ser. No. 729,558

Int. Cl.[2] G05B 9/02; H02H 7/00

U.S. Cl. 364—492 13 Claims



1. A method of monitoring and controlling the respective operating conditions of a plurality of electrical power transmission structures at a corresponding plurality of locations remote from each other comprising: sensing the operating condition of the power transmission structure at each of the locations; digitizing the information corresponding to the sensed operating condition from each location; communicating the digitized information to a microprocessing station at each location; processing the digitized information with a predetermined algorithm to cause the generation of signals corresponding to the operating condition of the corresponding power transmission structure; communicating the signals from each microprocessing station to a central processing region independently of the communication of the signals from the microprocessing stations of the other locations; and changing the operating conditions of the transmission structure at a location corresponding to a predetermined operating condition detected by the receipt of digitized information at the corresponding microprocessing station.

4,161,028

ELECTRIC DEMAND CONTROL SYSTEM

Frederick B. Davis, 3rd, Drexel Hill, and Charles W. Ross, Hatboro, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed May 30, 1978, Ser. No. 910,320

Int. Cl.[2] A02J 13/00; G06G 7/62

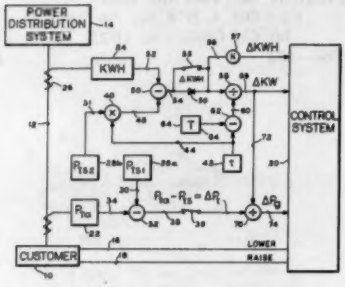
U.S. Cl. 364—492 11 Claims

1. A control system for controlling the consumption of power by a customer over a tie line connected to transfer power between a distribution system and said customer without the consumption exceeding a predetermined energy demand limit during a predetermined demand period, comprising:

means for determining the power transfer deviation as the change in generation or load required by the customer under existing conditions to make the energy transferred to the customer over the whole demand period correspond to the demand limit;

means for determining the energy transfer deviation as the deviation between the amount of energy actually transferred during the elapsed portion of the existing demand period and the desired energy transfer for that portion;

means for controlling said generation or load in response to said power transfer deviation to tend to reduce that deviation toward zero; and



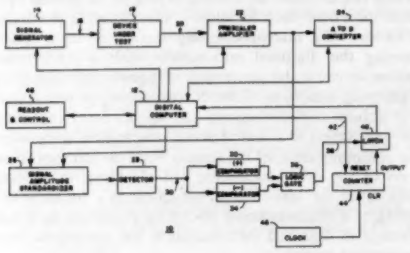
means for modifying the response of said control means in response to a quantity which is a joint function of said energy transfer deviation and the unelapsed time in the demand period.

4,161,029

AUTOMATIC TRANSIENT RESPONSE ANALYZER SYSTEM

George J. Frye, 12175 SW. Douglas St., Portland, Oreg. 97225, and Leonardus J. Geerling, Rte. 2, Box 124D, Hillsboro, Oreg. 97123

Filed Sep. 19, 1977, Ser. No. 834,799
Int. Cl.[2] G01R *15/12*
U.S. Cl. 364—579 **5 Claims**



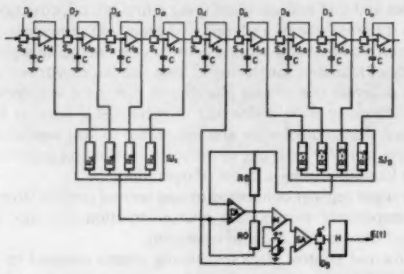
1. Automatic transient response analyzer system comprising:
digital computer means
signal generator means under control of said digital computer means for generating measurement signals to device under test;
prescaler amplifier means for receiving signals from said device under test and being under control of said digital computer means;
analog to digital converter means receiving signals from said prescaler amplifier means and under control of said digital computer means;
signal amplitude standardizer means receiving signals from said analog to digital converter means and being under control of said digital computer means;
detector means receiving signals from said signal amplitude standardizer means;
comparator means receiving signals from said detector means and for providing level-crossing output signals;
clock-driven counter means under control of said digital computer means;
latch means receiving signals from said counter means and said comparator means and for supplying signals to said digital computer means; and
readout and control means for sending and receiving signals from said digital computer means for providing output information.

4,161,030

REGENERATING A DEGENERATED CURVE

Eduard B. M. de Jong, Tilburg, Netherlands, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,641
Claims priority, application Netherlands, Jul. 19, 1976, 7607956
Int. Cl.[2] G01N *21/26*
U.S. Cl. 364—581 **7 Claims**



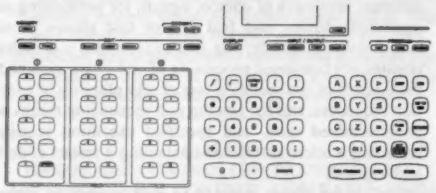
1. Apparatus for regenerating a degenerated curve, which curve is approximately degenerated exponentially, comprising a sampling means for sampling in a real time sense the degenerated curve, a memory for storing the samples and an arithmetic means arranged to determine each point of the regenerated curve from the sum of a central sample value, the weighted value of at least one sample preceding the central sample and the weighted value of at least one sample following the central sample.

4,161,031

PROGRAMMABLE CALCULATOR INCLUDING BOOLEAN FLAG VARIABLE MEANS

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,293
Int. Cl.[2] G06F *15/06, 3/02*
U.S. Cl. 364—709 **6 Claims**



1. An electronic calculator comprising:
keyboard input means for entering alphameric information, including lines of algebraic statements, into the calculator;
memory means for storing a program of lines of algebraic statements previously entered into the calculator;
processing means, coupled to said keyboard input means and memory means, for processing lines of algebraic state-

ments entered into the calculator and stored in said memory means to perform selected functions; and

output means, coupled to said processing means, for providing a visual indication of selected functions performed by said processing means;

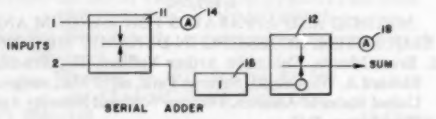
said keyboard input means including a plurality of keys for specifying one of a plurality of boolean flag variables to be entered as part of an algebraic statement, and a plurality of flag variable control keys for entering flag statements, each flag statement specifying one of a clearing, setting, and testing function in connection with a designated one of said plurality of boolean flag variables, said keyboard means including a display control key operative in combination with selected ones of said plurality of keys specifying one of said plurality of boolean flag variables for entering a flag display statement to initiate visual display on said output means of the state of the specified boolean flag variable.

4,161,032

SERIAL ARITHMETIC FUNCTIONS WITH MAGNETIC BUBBLE LOGIC ELEMENTS

Richard P. Williams, Columbia, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Washington, D.C.

Filed Feb. 16, 1978, Ser. No. 878,207
Int. Cl.[2] G06F *7/48*; G11C *11/14*
U.S. Cl. 364—714 **18 Claims**



1. A magnetic bubble device for performing an arithmetic operation on magnetic bubble streams representative of binary numbers, comprising:

input means for two or more magnetic bubble streams representative of binary numbers;

output means for at least one bubble stream representative of the result of the arithmetic operation; and

a magnetic bubble arithmetic unit connected between said input and output means, said arithmetic unit comprising:

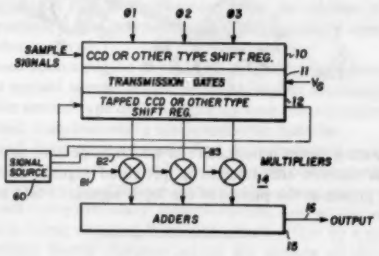
a plurality of magnetic bubble elements, said plurality including a first two-input AND-EXCLUSIVE OR bubble logic gate, said gate having first and second continuous, uninterrupted paths extending from the input to the output of said gate for the passage of bubbles therethrough, the outputs of said paths representative of the logical AND operation performed on bubbles input to said paths, and a third output path disposed between said first and second paths for providing an output representative of the EXCLUSIVE OR operation performed on bubbles input to said first and second paths, said gate further having a pair of preferred transition paths from said first and second paths to said third path such that a bubble entering on either of said first or second paths, in the absence of a bubble entering on the other path, exits the gate on said third path, said plurality of magnetic bubble elements interconnected in a fixed logical pipeline configuration within said unit for performing a predetermined arithmetic operation, said configuration characterized by an absence of bubble feedback paths internal to said unit.

4,161,033

CORRELATOR/CONVOLVER USING A SECOND SHIFT REGISTER TO ROTATE SAMPLE VALUES

Lloyd W. Martinson, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,233
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—728 **2 Claims**



1. A digital convolver/correlator comprising, in combination:

input means for supplying first input signals at a predetermined rate;

signal source means for supplying first shift signals at said predetermined rate;

serial in and parallel out first shift register means having a plurality of at least n first stages for receiving the first input signals and serially shifting said first input signals from stage to stage in response to said first shift signals;

transfer signal means for producing a transfer signal each time said first shift register means has received n input signals;

serial and parallel in and parallel out second shift register means having a plurality of n second stages with the signal output terminal of its final stage coupled to the signal input terminal of its first stage for enabling rotation of said first input signals through said second stages thereof;

transmission means responsive to said transfer signal for transferring the said first input signals in parallel manner from the stages of said first shift register means to corresponding stages of said second shift register means;

said signal source means constructed to supply to said second shift register means second shift signals for rotating the input signals from stage to stage therein at a rate not less than approximately said predetermined rate;

means providing a plurality of second input signals;

a plurality of multiplier means, each coupled to receive as a first input operand the first input signal from a different stage of said second shift register means and as a second input operand one of said second input signals to produce a product signal representative of the value of the first input signal applied thereto times the value of the second input signal applied thereto; and

summing means responsive to the product signals from said plurality of multiplier means for producing output signals.

4,161,034

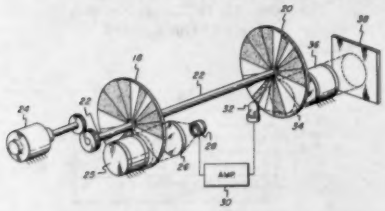
CORRELATION APPARATUS

Edward W. Stark, Garden City, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 7, 1962, Ser. No. 243,163
Int. Cl.[2] G06G *7/19*
U.S. Cl. 364—822 **9 Claims**

1. Signal handling apparatus comprising summing means adapted to receive simultaneously signals representing a function taken at one or more different phases of time, means providing simultaneously a plurality of signals representing said function taken at various phases of time, a plurality of multiplying means each of which receives the output signal from said

summing means and one of the simultaneously provided function signals, and a plurality of integrating means simultaneously receiving the product output signals from respective multiplying means, whereby peak output signals from said



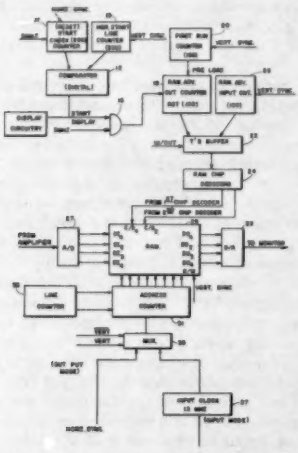
integrating means is indicative of which respective multiplying means receive simultaneously provided signals having the same phases as the phases of the input signals to said summing means.

4,161,035

CIRCUITRY FOR DISPLAYING A CONSTANTLY CHANGING M-MODE OUTPUT ON A RASTER SCAN DISPLAY

Yair Toor, Rehovot; Haim Rouso, Tel-Aviv, and Ben-Zion Kopilavitz, Petach Tikva, all of Israel, assignors to Israel Electro-Optical Industry Ltd., Rehovot, Israel

Filed Oct. 31, 1977, Ser. No. 847,021
Int. Cl.[2] G06F 3/14
U.S. Cl. 364—900 **2 Claims**



1. Circuitry for displaying a constantly changing M-mode transducer scan output on a raster scan display associated with synchronization circuitry, said scan output being in the form of a first multiplicity of data lines each containing a second multiplicity of data words and each representing a scan of the transducer output at a particular closely spaced scanning time and such that the data line representing the oldest scan is periodically erased and a data line representing the newest scan is displayed, said circuitry comprising:

means for receiving data representing sequential scans of an M-mode ultrasound transducer output;

random access memory means, comprising a first multiplicity of memory elements, each for storing one of said first multiplicity of data lines representing a sample of the M-mode ultrasound transducer output;

horizontal start line counter means receiving a vertical synchronization signal from the synchronization circuitry and providing a first output indicating the relative horizontal position at which an information display sequence begins;

start check counter means receiving a horizontal synchronization signal and a clock signal from the synchronization circuitry for producing a second output indicating the horizontal position at which the raster beam of the display is currently located;

comparator means receiving said first and second outputs and providing a start display signal when said first and second outputs indicate the same horizontal position;

first random access counter memory means providing a third output;

random access memory advance output counter means receiving said start display signal from said comparator means and operative in response thereto to provide a fourth output representing instructions to said random access memory means, sequentially to read out, one data word from each data line during each raster scan beginning at a data word contained in a data line indicated by said third output; and

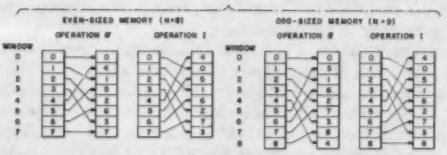
random access memory input counter means receiving said vertical synchronization signal from said synchronization circuitry and providing a fifth output operative to load a data line representing the newest scan into said random access memory means at a memory element determined by said third output, such that upon receipt of every vertical synchronization signal a line of data is stored in sequential ones of said first multiplicity of memory elements.

4,161,036

METHOD AND APPARATUS FOR RANDOM AND SEQUENTIAL ACCESSING IN DYNAMIC MEMORIES

S. Brent Morris, Columbia; Arthur Valliere, III, Arnold, and Richard A. Wisniewski, Severna Park, all of Md., assignors to United States of America, Director National Security Agency, Washington, D.C.

Filed Nov. 8, 1977, Ser. No. 849,561
Int. Cl.[2] G06F 7/00
U.S. Cl. 364—900 **21 Claims**



1. A memory system comprising:

a dynamic memory having N locations, 0, . . . , N−1, for the storage of data, wherein N is any odd number or any integer power of 2;

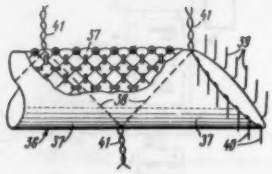
first and second interconnections among said storage locations such that the data in said memory may be rearranged in accordance with first and second shuffle operations, wherein said first shuffle operation is an In Shuffle and said second shuffle is an Out Shuffle; and

control means connected to said first and second interconnections and responsive to the input address of a desired datum for generating control signals defining a sequence of said shuffle operations, said control signals enabling said first and second interconnections such that said dynamic memory is reconfigured in accordance with said shuffle operations to access said datum to a preselected memory location.

4,161,037
FERRITE CORE MEMORY

Jury E. Seleznev; Jury A. Burkin, and Sergei V. Kuzmin, all of Novosibirsk, U.S.S.R., assignors to Vychislitelny Tsentr Sibirskogo Otdelenia Akademii Nauk SSSR, U.S.S.R.

Continuation of Ser. No. 516,131, Oct. 18, 1974, abandoned, which is a division of Ser. No. 319,053, Dec. 27, 1972, Pat. No. 3,858,310. This application Jan. 17, 1977, Ser. No. 759,872
Int. Cl.[2] G11C 5/08
U.S. Cl. 365—51 1 Claim

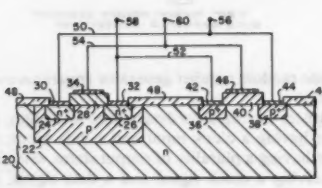


1. A ferrite core memory in the form of a cylindrical hollow plait, comprising: a plurality of matrices comprising ferrite cores threaded with mutually perpendicular coordinate wires and wires forming readout and inhibition windings; the matrices being connected edge to edge and helically wound to form the cylindrical surface of the plait, with a helical junction between adjacent matrices the coordinate wires forming opposed helices lying on the cylindrical surface of the plait; and outgoing leads of the readout and inhibition windings being distributed longitudinally of the plait along said junction.

4,161,038
COMPLEMENTARY METAL-FERROELECTRIC SEMICONDUCTOR TRANSISTOR STRUCTURE AND A MATRIX OF SUCH TRANSISTOR STRUCTURE FOR PERFORMING A COMPARISON

Shu-Yau Wu, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 20, 1977, Ser. No. 834,941
Int. Cl.[2] G11C 11/40; G06G 7/00
U.S. Cl. 365—145 13 Claims



1. A complementary metal-ferroelectric-semiconductor device that provides a controllable minimum current in response to selected voltages, said semiconductor device comprising:

a first semiconductor material having a first type of dopant impurity;

a semiconductor material located in the first semiconductor material, said complementary semiconductor material comprised of a second type of dopant impurity;

a first source region in said complementary semiconductor material, said first source region having a concentration of the first type of dopant impurity that is higher than the concentration of said first type of dopant impurity in the semiconductor substrate;

a first drain region in said complementary semiconductor material, said first drain region having a higher concentration of the first type of dopant impurity than the first semiconductor material, said first drain region being displaced from said first source region by a predetermined lateral distance across the surface of the complementary semiconductor material;

a first ferroelectric film adjoining the complementary semiconductor material along the predetermined lateral distance between said first source region and said first drain region;

first source and drain electrodes covering the surface of the first source and first drain regions respectively and a first gate electrode covering the surface of said ferroelectric film that is oppositely disposed from the surface of the ferroelectric film adjoining the complementary semiconductor material;

a second source region in said first semiconductor material, said second source region having a higher concentration of the second type dopant impurity than the concentration of said complementary semiconductor material;

a second drain region in said first semiconductor material, said second drain region having a higher concentration of the second type of dopant impurity than the concentration of said complementary semiconductor, said second drain region being disposed from said source retion by a predetermined lateral distance across the surface of the first semiconductor material;

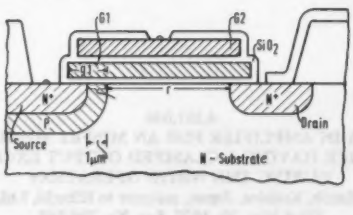
a second ferroelectric film adjoining the first semiconductor material along the predetermined lateral distance between said second source region and said second drain region; and

second source and drain electrodes covering the surface of the second source and the second drain regions respectively, and a second gate electrode covering the surface of said second ferroelectric film that is oppositely disposed from the surface of the ferroelectric film adjoining the first semiconductor material, the first drain and source electrodes being respectively connected to the second source and drain electrodes, and the first gate electrode being connected to the second gate electrode such that the first and second electrodes are connected in complementary fashion.

4,161,039
N-CHANNEL STORAGE FET

Bernward Rössler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 750,860, Dec. 15, 1976, Pat. No. 4,087,795. This application Feb. 6, 1978, Ser. No. 875,700
Int. Cl.[2] G11C 11/40
U.S. Cl. 365—185 11 Claims



1. In an n-channel storage field effect transistor (FET) having:

a source, a channel, and a drain;

at least one gate which is a floating storage gate surrounded on all sides by an insulator including means for recharging of the storage gate by channel injection wherein electrons on account of their heating and through an electric field acting in a source-drain direction overcome an energy threshold to a conductivity band of the insulator and thus reach the storage gate;

said channel injection being employed for programming by charging of the storage gate;

said storage gate, due to its charge and by influencing the source-drain current, exerting a restrictive influence upon a source-drain path;

in an unprogrammed state said channel being of a depletion type;

an additional, controllable control gate being provided which has a terminal and in capacitive interaction with the storage gate;

wherein the improvement comprises:

a length of said channel being determined by a thickness of a P doped P layer segment formed in an N-doped substrate directly beside a diffused N+doped N+layer segment as a source;

said N+layer segment being located directly beside said P layer segment;

an N+doped N+layer segment as a drain being arranged at an interval from the P layer segment which forms a drift path, said interval being at least approximately equal to a thickness of said P layer segment between the source and the drift path;

the storage gate and the control gate being arranged in insulated fashion above a surface of the substrate at a predetermined distance for influencing the channel path; and

means for erasure by irradiation with ultraviolet light, said means comprising the storage gate projecting beyond the control gate by which it is otherwise covered.

4,161,040

DATA-IN AMPLIFIER FOR AN MISFET MEMORY DEVICE HAVING A CLAMPED OUTPUT EXCEPT DURING THE WRITE OPERATION

Takashi Satoh, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

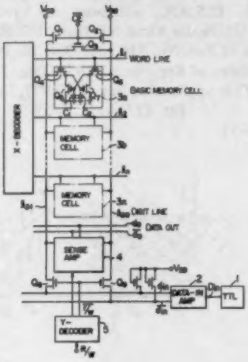
Filed May 20, 1977, Ser. No. 798,865

Claims priority, application Japan, May 24, 1976, 51-59117

Int. Cl.[2] G11C 7/02

U.S. Cl. 365—203 **20 Claims**

19. A dynamic type MIS memory device having memory cells, data lines coupled to said cells, a data-in amplifier for writing information into said cells, and a transfer gate coupled between said data line and said data-in amplifier and being operative under a read-and-write command signal, wherein said data-in amplifier comprises means for holding the output of said data-in amplifier at a precharge potential level of said



data line except in the write mode in response to said read-and-write command signal.

4,161,041

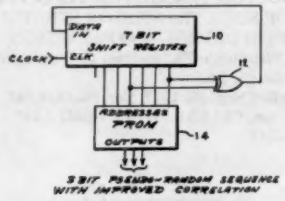
PSEUDO RANDOM NUMBER GENERATOR APPARATUS

Eric W. Butler, Severna Park, and Clinton W. Moulds, III, Millersville, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,190

Int. Cl.[2] G11C 13/00

U.S. Cl. 365—244 **7 Claims**



1. A pseudo random number generator apparatus comprising in combination:

a shift register having a predetermined bit length, said shift register having a clock input and a data input, said shift register having a plurality of output states, said shift register receiving a clock signal and a data signal, said shift register shifting said data signals to said plurality of output states,

an exclusive or gate having a predetermined number of input lines and an output line, said output line being connected to said data input of said shift register, each line of said predetermined number of input lines being randomly connected to a single line of said plurality of output states of said shift register, and,

a programmable read only memory connected to (n−1) of said plurality of output states of said shift register wherein n is equal to number of said predetermined bit length, said programmable read only memory have a plurality of output lines, said programmable read only memory assigning addresses to each integer appearing on said plurality of output lines, said programmable read only memory providing a random number on said plurality of output lines.

DESIGN PATENTS

GRANTED JUL. 10, 1979

ERRATA

For CLASS	See PATENT NO.
021–030	252,343
021–022	252,344
021–120	252,345
021–227	252,346
021–227	252,347
021–134	252,348
015–124	252,349
017–022	252,353
003–030	252,354
003–048	252,355

DESIGNS

JULY 10, 1979

252,296

SHOE PROTECTOR OR SIMILAR ARTICLE

Richard S. Alegria, 912 Arguello St., Apt. 3, Redwood City, Calif. 94063

Filed Mar. 28, 1977, Ser. No. 781,923

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—277

252,297

SLIPPER

Lorenzo C. Vinas, Banolas, Spain, assignor to Comercial Exportadora Banolense S.A., Banolas, Spain

Filed Jul. 16, 1976, Ser. No. 705,857

Claims priority, application Spain, Feb. 4, 1976, 86190

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—300

252,298

COMBINED BRUSH HANDLE AND BACK

Maurice C. Baudon, Beauvais, France, assignor to S.A. Ets Lardenois, Hermes, France

Filed Nov. 24, 1975, Ser. No. 634,329

Claims priority, application France, Jun. 6, 1975, 267

Term of patent 14 years

Int. Cl. D4—*02*

U.S. Cl. D4—35

252,299

DISPLAY RACK

Simeon Marshall, Chicago, Ill., assignor to Rachengold-Werk Adolf Speck, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,986

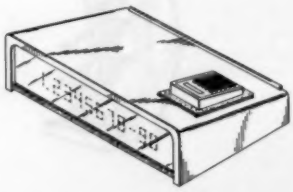
Term of patent 14 years

Int. Cl. D20—*02*

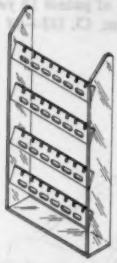
U.S. Cl. D6—23

252,300
MOBILE INTRAVENOUS STAND
John W. Pryor, 420 N. Cedros, Solana Beach, Calif. 92075
Filed May 11, 1977, Ser. No. 795,794
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28

252,301
COMBINED LECTERN AND DISPLAY CALCULATOR
George S. McCarty, Laguna Beach, Calif., assignor to Educational Calculator Devices, Inc.
Filed Feb. 23, 1977, Ser. No. 771,391
Term of patent 14 years
Int. Cl. D6—*06*; D18—*01*
U.S. Cl. D6—155

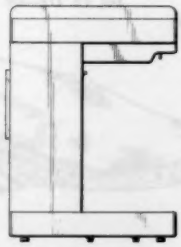


252,302
JEWELRY CADDY
Warren E. Persky, Dallas, Tex., assignor to Item House, Inc., Dallas, Tex.
Filed May 3, 1978, Ser. No. 902,768
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

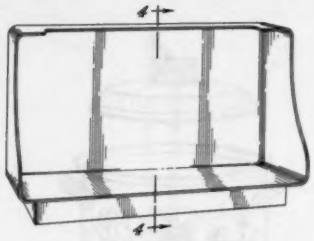


252,303
JEWELRY CADDY
Warren E. Persky, Dallas, Tex., assignor to Item House, Inc., Dallas, Tex.
Filed May 3, 1978, Ser. No. 902,769
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

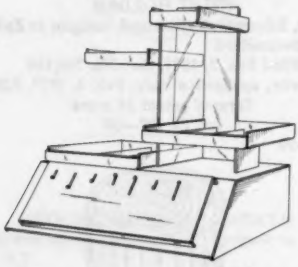
252,304
SEWING MACHINE WORK TABLE OR SIMILAR ARTICLE
Wayne A. Current, 17 Mabern Dr., Holmdel, N.J. 07733
Filed Oct. 8, 1976, Ser. No. 731,067
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179



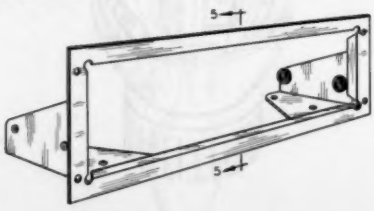
252,305
DISPLAY UNIT
Phillip A. Waters, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Apr. 7, 1978, Ser. No. 894,573
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—181



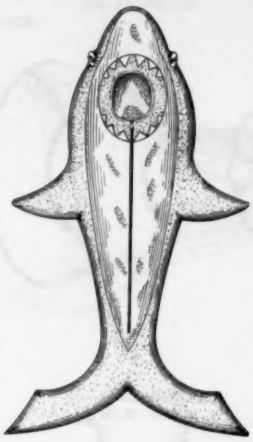
252,306
COMBINED DISPLAY RACK AND SELECTION CONSOLE
Myron L. Denhoff, 435 E. 85th St., New York, N.Y. 10028
Filed May 18, 1978, Ser. No. 901,748
Term of patent 3½ years
Int. Cl. D20—*02*
U.S. Cl. D6—188



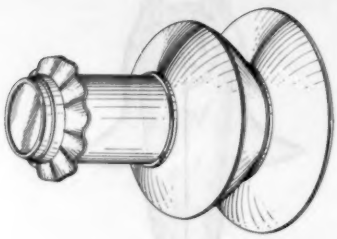
252,307
DRAWER SUSPENSION FRAME
Max E. Hosmer, Charlevoix, Mich., assignor to Freedman Artcraft Engineering Corp., Charlevoix, Mich.
Filed May 12, 1977, Ser. No. 796,469
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

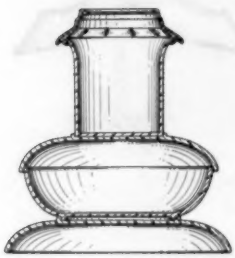


252,308
SLEEPING BAG
Robert J. Ochwat, 13215 Mackinaw, Chicago, Ill. 60633
Filed Mar. 21, 1977, Ser. No. 779,298
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—268

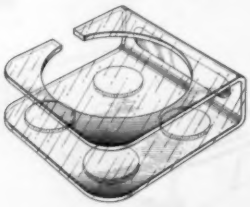


252,309
DINNERWARE SET
Michel Schwartz, Great Neck, N.Y., assignor to Miramar of California, Los Angeles, Calif.
Filed Oct. 20, 1976, Ser. No. 734,057
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3



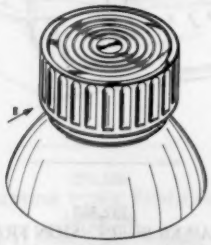


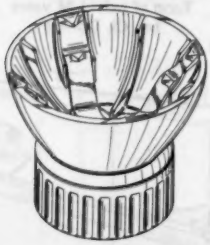
252,310
PLASTIC CUP HOLDER
Marvin B. Shannon, 1413 Grand Ave., Fort Worth, Tex. 76106
Filed Nov. 14, 1977, Ser. No. 851,541
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—70



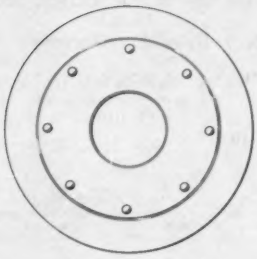
252,311
DECORATED COOKING POT OR SIMILAR ARTICLE
Graziano Prussi, Florence, Italy, assignor to Moneta S.p.A., Milan, Italy
Filed Dec. 14, 1977, Ser. No. 860,739
Claims priority, application Italy, Jun. 17, 1977, 21562 B/77
Term of patent 3½ years
Int. Cl. D7—*02*
U.S. Cl. D7—97

252,312
FRUIT HOLDER
Peter Ackeret, Küsnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland
Filed Feb. 2, 1977, Ser. No. 764,154
Claims priority, application Italy, Feb. 2, 1977, 52883 B/77
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—99

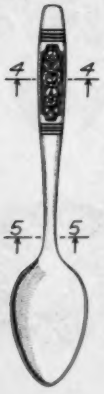




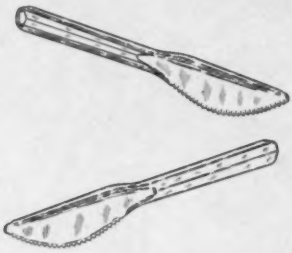
252,313
HEAT STORAGE BASE FOR DINNERWARE
Thomas J. Landry, Old Saybrook, Conn., assignor to AMF Incorporated, White Plains, N.Y.
Filed Oct. 11, 1977, Ser. No. 840,697
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—130



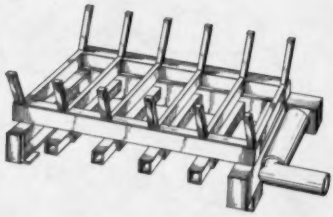
252,314
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Oct. 31, 1977, Ser. No. 847,116
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



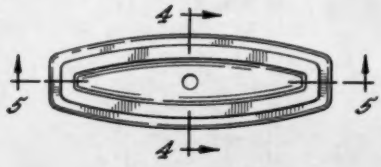
252,315
KNIFE
William A. Dart, Mason, Mich., assignor to Dart Container Corporation, Mason, Mich.
Filed Dec. 13, 1976, Ser. No. 749,718
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—138



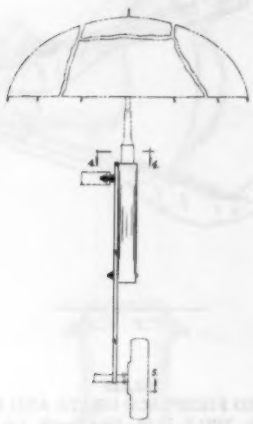
252,316
COMBINED FIREPLACE GRATE AND HEATER
Donald D. Cagle, 2500 S. U St., Fort Smith, Ark. 72901
Filed Dec. 23, 1977, Ser. No. 863,810
Term of patent 14 years
Int. Cl. D7—*08;* D23—*03*
U.S. Cl. D7—207



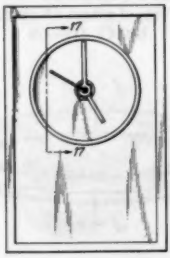
252,317
ESCUTCHEON
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Jun. 19, 1978, Ser. No. 916,342
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350



252,318
GOLF CART CARRIED OPEN UMBRELLA HOLDER
George W. Kriegner, 13908 Rossini, Detroit, Mich. 48205
Filed Nov. 10, 1976, Ser. No. 740,414
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—373



252,319
CLOCK
Paul S. Kopel, 55 Oakdale Dr., Rochester, N.Y. 14618
Filed Jan. 27, 1977, Ser. No. 762,850
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—25



252,320
VEHICLE SPEEDOMETER METRIC CONVERSION LABEL
Harry Chojna, 1 Dallas Ct., Hughesdale, Victoria 3166, Australia
Filed Sep. 15, 1976, Ser. No. 723,436
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103

252,321
VEHICLE SPEEDOMETER METRIC CONVERSION LABEL
Harry Chojna, 1 Dallas Ct., Hughesdale, Victoria 3166, Australia
Filed Sep. 15, 1976, Ser. No. 723,438
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103

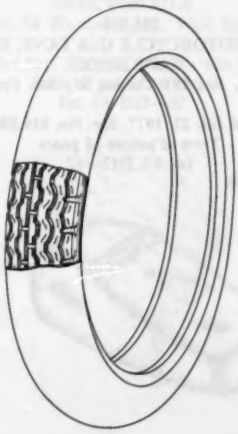
252,322
FINGER RING
Russell C. Johnson, 4625 Red Bank Rd., Cincinnati, Ohio 45227
Filed Sep. 5, 1975, Ser. No. 610,683
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—31

252,323
KEY CHAIN FOB
Lester V. Molenaar, P.O. Box 777 W. Hwy. 40, Willmar, Minn. 56201
Filed Oct. 25, 1977, Ser. No. 844,704
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D11—81

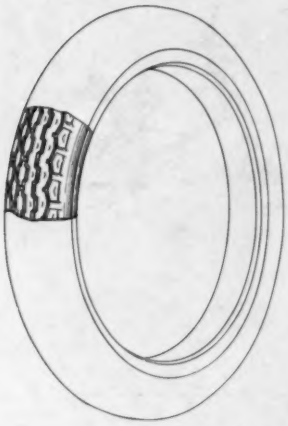
252,324
STABILIZER JACK
Julius F. John, Gardena, Calif., assignor to Norco Industries, Inc., Gardena, Calif.
Filed Jul. 1, 1977, Ser. No. 812,398
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55

252,325
MOTORCYCLE
Makoto Hori, 5-8-204, Nishiyamato-danchi, Wako-shi, Saitama-ken, and Hiroshi Nakano, 2-1-5, Kamiigusa, Suginami-ku, Tokyo, both of Japan
Filed Dec. 28, 1977, Ser. No. 865,341
Claims priority, application Japan, Jun. 30, 1977, 52-25697
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

252,326
TIRE
Barrington S. Gill, and Claude A. Hart, both of Sutton Coldfield, England, assignors to Dunlop Limited, United Kingdom
Filed Sep. 14, 1977, Ser. No. 833,388
Claims priority, application United Kingdom, Mar. 16, 1977, 979287/77
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—141

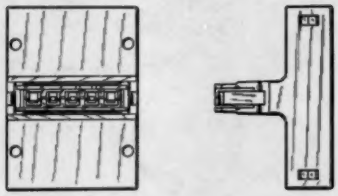


252,327
TIRE
Hisashi Shirashoji, Kobe, Japan, assignor to Dunlop Limited, England
Filed Nov. 7, 1977, Ser. No. 849,334
Claims priority, application Japan, May 30, 1977, 52-20838
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



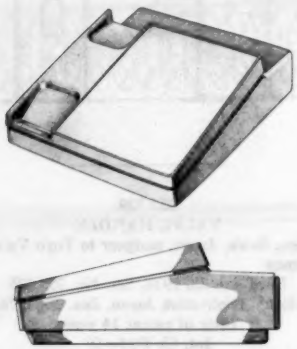
252,328
COMBINED MOTORCYCLE GAS TANK, RADIO AND TAPE DECK
James T. Moore, Sr., 191 Corona St., San Francisco, Calif. 94127
Filed Jul. 27, 1977, Ser. No. 819,591
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—155

252,329
CIRCUIT CONNECTOR MODULE
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.
Filed Sep. 29, 1977, Ser. No. 837,756
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

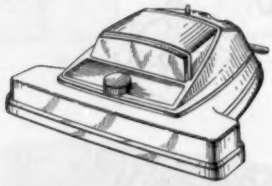


252,330
RECORD PLAYER
Leslie A. Leech, Frewchie, Scotland, assignor to BSR Limited, Warley, England
Filed Aug. 18, 1976, Ser. No. 715,642
Claims priority, application United Kingdom, Feb. 28, 1976, 974702
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—17

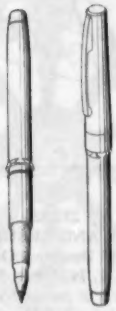
252,331
TELEPHONE STAND
Andrew J. Baase, Beach Grove; John G. Engstrom, Indianapolis, both of Ind.; Donald M. Genaro, Haworth, N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 614,510, Sep. 18, 1975, Pat. No. Des. 246,584. This application Aug. 15, 1977, Ser. No. 824,417
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



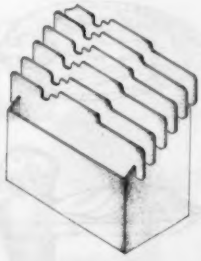
252,332
WIDE TRACK VACUUM CLEANER HOUSING
Harold W. Schaefer, Bloomington, Ill., assignor to National Union Electric Corporation
Filed Apr. 6, 1977, Ser. No. 785,057
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—53



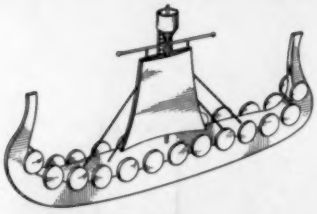
252,333
FELT TIP PEN
Takaji Funahashi, No. 1, 2-chome, Kitatakasho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan
Filed Aug. 31, 1977, Ser. No. 829,325
Claims priority, application Japan, Mar. 11, 1977, 52-8979
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47



252,334
DESK TOP FILE
Donald I. Small, 60 Woodward Rd., West Springfield, Mass. 01089
Filed Sep. 16, 1977, Ser. No. 834,139
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—90

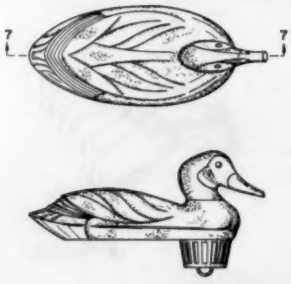


252,335
TOY SHIP
Leon Goldpaint, 11702 Dunning St., Santa Fe Springs, Calif. 90670
Filed Jan. 3, 1977, Ser. No. 756,343
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—130

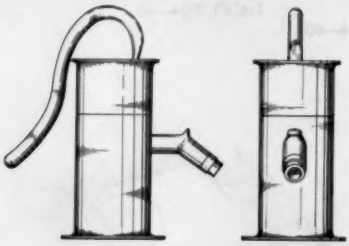


252,336
FISH HOOK AND LEADER HOLDER
Vincent Grippi, Jr., 4955 Desmond, Oakland, Calif. 94618
Filed Sep. 1, 1977, Ser. No. 829,873
Term of patent 7 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

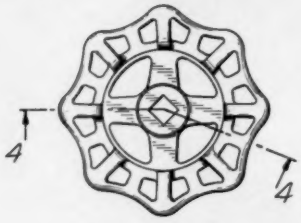
252,337
CHLORINATOR FOR SWIMMING POOLS
James M. Hehnen, 3881 W. 160th St., Cleveland, Ohio 44111
Filed Jul. 26, 1977, Ser. No. 819,070
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



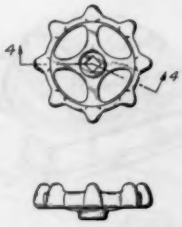
252,338
KITCHEN FAUCET
Clifton D. Skinner, R.F.D. #1, Box 96, Dexter, Me. 04930
Continuation-in-part of Ser. No. 713,853, Aug. 11, 1976. This application Nov. 2, 1978, Ser. No. 957,242
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23



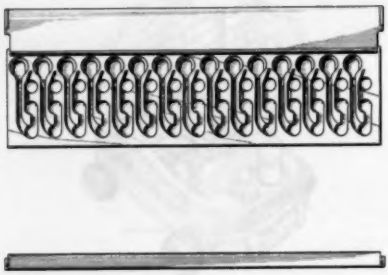
252,339
VALVE HANDLE
Masao Okano, Suwa, Japan, assignor to Toyo Valve Co., Ltd., Tokyo, Japan
Filed Jul. 28, 1976, Ser. No. 709,375
Claims priority, application Japan, Jan. 28, 1976, 51-2218
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—30



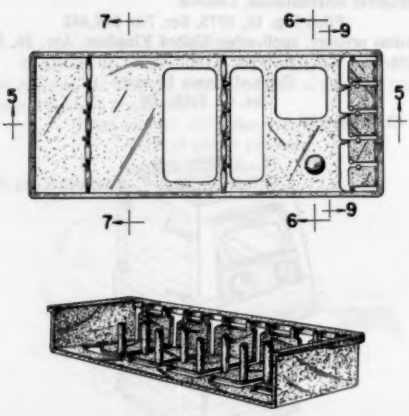
252,340
VALVE HANDLE
Masao Okano, Suwa, Japan, assignor to Toyo Valve Co., Ltd., Tokyo, Japan
Filed Jul. 28, 1976, Ser. No. 709,377
Claims priority, application Japan, Jan. 28, 1976, 51-2219
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—30



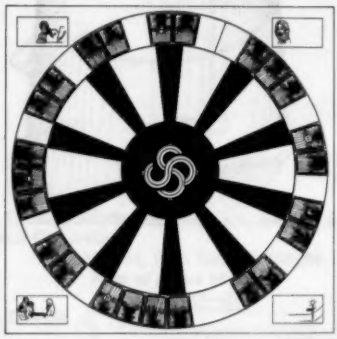
252,341
TESTING TRAY
Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Barrington, Ill.
Filed May 12, 1977, Ser. No. 796,394
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—29



252,342
TAMPER PROOF TRAY FOR HYPODERMIC SYRINGES
Joseph E. Brady, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.
Filed May 23, 1977, Ser. No. 799,915
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—31



252,343
GAME BOARD
John Ilich, 1885 Spaulding, SE., Grand Rapids, Mich. 49506
Filed Feb. 2, 1977, Ser. No. 764,808
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—30



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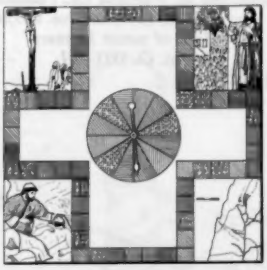
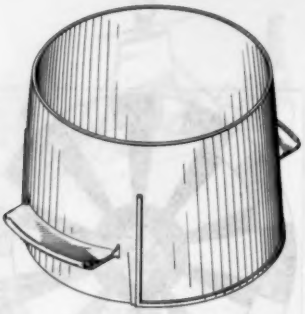
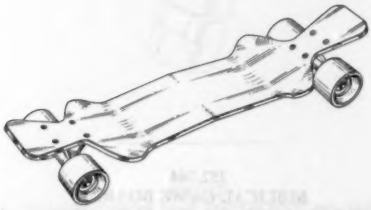
William E. Parker, P.O. Box 284, McDonald, Tenn. 37353; William E. Parker, Jr., 1507 Lee St., and Larry D. Hawkins, 2807 Bo St., both of Cleveland, Tenn. 37311
Filed May 27, 1977, Ser. No. 801,256
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—22



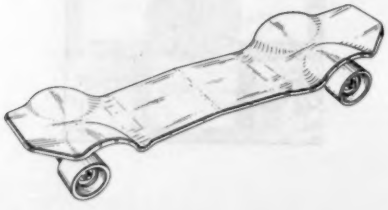
252,345
TOY MOLD
Frederick W. Bassinger, Edina, Minn., assignor to K-tel International, Inc.
Filed Feb. 7, 1977, Ser. No. 765,910
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120



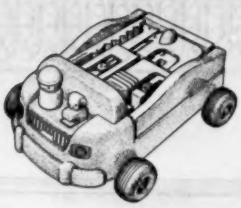
252,346
SKATEBOARD
John S. Solheim, 529 W. Wakona La., Phoenix, Ariz. 85023
Filed Sep. 28, 1977, Ser. No. 837,457
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—227



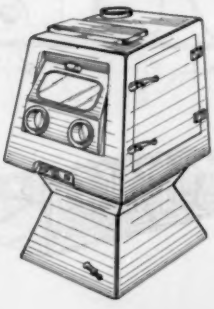
252,347
SKATEBOARD
John S. Solheim, 529 W. Wakonda La., Phoenix, Ariz. 85023
Filed Sep. 28, 1977, Ser. No. 837,561
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—227



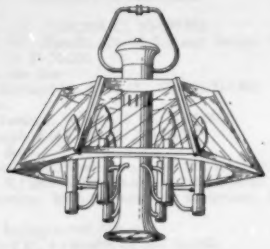
252,348
COMBINED TOY VEHICLE AND REMOVABLE FIGURES THEREFOR
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 657,327, Feb. 11, 1976. This application Oct. 28, 1977, Ser. No. 846,476
Claims priority, application Japan, Sep. 10, 1975, 50-36870
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134



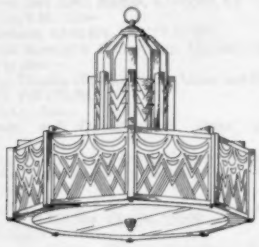
252,349
ABRADING MACHINE CABINET
Stewart I. Ashworth, Guernsey, Channel Islands, assignor to Abrasives International, Limited
Filed Sep. 18, 1975, Ser. No. 614,542
Claims priority, application United Kingdom, Apr. 26, 1975, 970881/75
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—124



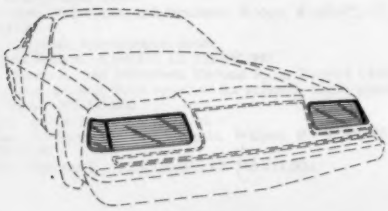
252,350
LIGHT FIXTURE
Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605
Filed Jun. 2, 1977, Ser. No. 802,975
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—3



252,351
LIGHT FIXTURE
Fredrick G. Glassman, 9170 La Alba, Whittier, Calif. 90605
Filed Jun. 2, 1977, Ser. No. 802,990
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

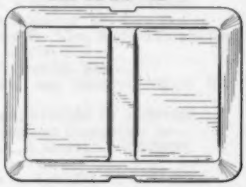


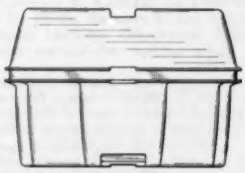
252,352
PAIR OF AUTOMOBILE HEADLAMP LENSES
Carl A. Cameron, Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Jan. 27, 1977, Ser. No. 763,163
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A



252,353
DRUM LUG
Daniel S. Mikosz, Arlington Heights, Ill., assignor to Ludwig Industries, Chicago, Ill.
Filed Jul. 16, 1976, Ser. No. 705,906
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22

252,354
BATTERY BOX
Tim M. Uyeda, South San Gabriel, Calif., assignor to Flambeau Products Corporation
Filed May 24, 1977, Ser. No. 800,090
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30





* 252,355
GAMING POUCH FOR KENO OR THE LIKE
Robert N. Uber, 4132 W. Cavalier Dr., Phoenix, Ariz. 85019
Filed Sep. 3, 1976, Ser. No. 720,221
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—48

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TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Keur, Robert I., 4,160,982, Cl. 346-75.000.

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Asper, Wayne E., 4,160,354, Cl. 53-497.000.
Mais, James W.; Bianchi, David L.; and Barker, Theodore L., 4,160,351, Cl. 53-76.000.

Abbott Laboratories: *See—*
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Kemp, Willard E., 4,160,460, Cl. 137-72.000.

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Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.

Adachi, Makoto: *See—*
Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, 4,160,784, Cl. 260-570.0AB.

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La Mell, Kenneth; and Schneider, Gerry, 4,160,972, Cl. 340-541.000.

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Inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyanishi, Toshiaki, 4,160,824, Cl. 424-84.000.

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Reistad, Bengt R., 4,160,366, Cl. 62-476.000.

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Kallberg, Tommy K.; and Rangert, Bo, 4,160,321, Cl. 30-383.000.

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Lukac, Frederick S.; and Zbryski, William P., 4,160,677, Cl. 134-9.000.
Miller, Clarence L., Jr., 4,160,681, Cl. 148-111.000.

Allen, Richard C.: *See—*
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Allen, Theodore L., Jr.: *See—*
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.

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Nishida, Takao; and Tonoike, Kiyoshi, 4,160,756, Cl. 260-29.60M.

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Doyle, Carlos L., 4,160,731, Cl. 210-50.000.
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Sergeant, Ronald G., 4,160,317, Cl. 29-749.000.
Weisenburger, Lawrence P., 4,160,573, Cl. 339-99.00R.

Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., to International Business Machines Corporation. High performance bipolar device and method for making same. 4,160,991, Cl. 357-49.000.

Andersen, John N.; and Bell, Norman. Pyrohydrolysis process for spent aluminum reduction cell linings. 4,160,808, Cl. 423-119.000.

Andersen, John N.; and Bell, Norman, to Kaiser Aluminum & Chemical Corporation. Modified pyrohydrolysis process for spent aluminum reduction cell linings. 4,160,809, Cl. 423-119.000.

Andersen, Jorgen; and Nielsen, Ole, to Radiometer A/S. Measuring chamber unit. 4,160,714, Cl. 204-195.00R.

Anderson, John: *See—*
Columbus, Peter S.; and Anderson, John, 4,160,750, Cl. 260-17.4ST.

Anthony, Thomas R.: *See—*
Houston, Douglas E.; Cline, Harvey E.; and Anthony, Thomas R., 4,160,679, Cl. 148-1.500.

Antioch Bookplate Company: *See—*
Neff, Elias, 4,160,352, Cl. 53-137.000.

Aoki, Eiichiro: *See—*
Yamada, Shigeru; and Aoki, Eiichiro, 4,160,404, Cl. 84-1.260.

Apollo Spinner, Inc.: *See—*
Cooney, Robert M., 4,160,554, Cl. 280-87.04A.

Appleton Machine Company: *See—*
Plach, Edward F., 4,160,530, Cl. 242-68.200.

Applied Power, Inc.: *See—*
Severson, Larry A., 4,160,537, Cl. 254-50.300.

Architectural Research Corporation: *See—*
Prusinski, Richard C.; and Prusinski, Jan R., 4,160,761, Cl. 260-42.470.

Arco Polymers, Inc.: *See—*
Fava, Ronald A., 4,160,792, Cl. 525-148.000.

Arendt, Ronald H.; and Curran, Matthew J., to General Electric Company. Silicon-iron production and composition and process therefor. 4,160,705, Cl. 204-37.00R.

Arendt, Ronald H.; and Curran, Matthew J., to General Electric Company. Coated silicon-iron product and process therefor using magnesium formate and metaborate. 4,160,706, Cl. 204-37.00R.

Arendt, Ronald H.; and Curran, Matthew J., to General Electric Company. Coated silicon-iron product and process therefor using calcium formate. 4,160,708, Cl. 204-37.00R.

Argus Chemical Corporation: *See*—
Minagawa, Motonobu; and Sekiguchi, Tetsuo, 4,160,762, Cl. 260-45.75S.

Ariyan, Zaven S.: *See*—
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,160,768, Cl. 260-306.70T.

Armagast, David W.: *See*—
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,160,443, Cl. 126-270.000.

Armstrong, James E., to Pool Company. Leg structure for jack-up platform with single point jacking. 4,160,538, Cl. 254-89.00R.

Arnold Industries, Inc.: *See*—
Blackstone, George H., 4,160,472, Cl. 144-194.000.

Artbauer, Jan, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. High voltage device with gas insulation. 4,160,870, Cl. 174-14.00R.

Arthur D. Little, Inc.: *See*—
Hidden, William P.; and McCullough, John E., 4,160,629, Cl. 418-55.000.

ASEA Aktiebolag: *See*—
Marchner, Jan; and Sundberg, Yngve, 4,160,868, Cl. 13-11.000.

Ashton, Larry J.; and Block, Leo, to Raypak, Inc. Securement of heat exchanger surfaces to tubes by lock seaming and method of fabrication. 4,160,476, Cl. 165-171.000.

Asper, Wayne E., to A-T-O Inc. Packing head fill safety device. 4,160,354, Cl. 53-497.000.

Aurifex Limited: *See*—
East, Harvey J., 4,160,361, Cl. 59-82.000.

Austin-Brown, P.; Youde, D.; and Pond, R. F., to Unerman Greenman Berger Limited. Coupling device for furniture parts. 4,160,610, Cl. 403-407.000.

Austin, Lowell W.: *See*—
Bird, Richard A.; and Austin, Lowell W., 4,160,703, Cl. 204-15.000.

Autotrol Corporation: *See*—
Prosser, David G., 4,160,736, Cl. 210-150.000.

Avco Corporation: *See*—
Blake, Nathan L.; and Stelzer, Robert A., 4,160,355, Cl. 56-98.000.
Branen, Kenneth E., 4,160,800, Cl. 264-345.000.

Avery International Corporation: *See*—
Spear, Phillip L., 4,160,687, Cl. 156-444.000.

Ayler, Steven E.; and Holtrop, John W., to United States of America, Navy. Liquid propellent gun, positive displacement single valve. 4,160,405, Cl. 89-7.000.

Baba, Masanao, to Nippon Cable System Inc. Two-lever control unit. 4,160,499, Cl. 192-0.098.

Bach-Simpson Limited: *See*—
Carriere, Victor, 4,160,388, Cl. 73-646.000.

Backx, Leo J. J.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,160,841, Cl. 424-273.00R.

Badolato, Anthony; and Farrell, Joseph S., to Surgikos. Heat exchanger-blood oxygenator combination. 4,160,801, Cl. 422-46.000.

Bahler, Peter: *See*—
Benz, Maurice E.; and Bahler, Peter, 4,160,602, Cl. 366-162.000.

Baker CAC, Inc.: *See*—
Akkerman, Neil H.; Foster, Stephen R.; and Goans, Kip B., 4,160,463, Cl. 137-596.180.

Baldwin, Francis P.: *See*—
Gardner, Irwin J.; and Baldwin, Francis P., 4,160,759, Cl. 260-40.00R.

Baldwin, Stanley L., to International Nickel Company, Inc., The. Cable rock anchor. 4,160,615, Cl. 405-259.000.

Ballinger, Hugh A., to United Kingdom Atomic Energy Authority. Sealing members. 4,160,464, Cl. 138-93.000.

Baracz, Andrew J., to United States of America, Army. Programmed self-destruct system for a munition. 4,160,416, Cl. 102-215.000.

Barber, Warren A.; and Seesselberg, Henry A., to Singer Company, The. Programmable sewing system with auxiliary memory. 4,160,422, Cl. 112-121.110.

Barker, Theodore L.: *See*—
Mais, James W.; Bianchi, David L.; and Barker, Theodore L., 4,160,351, Cl. 53-76.000.

Barnickle, Andrew. Heat exchanger. 4,160,440, Cl. 126-110.00R.

Barrett, Donald R. Golf putting frame game device. 4,160,550, Cl. 273-176.00F.

Barrington, James E., to Abcor, Inc. Apparatus for and method of sterilization by the delivery of tubal-occluding polymer. 4,160,446, Cl. 128-1.00R.

Bartholomew, Roger F.; Mach, Joseph F.; and Wu, Che-Kuang, to Corning Glass Works. Method for making silver-containing glasses exhibiting thermoplastic properties and photosensitivity. 4,160,654, Cl. 65-30.00E.

Barton, Peter; and Lamb, Philip W. J., to Xerox Corporation. Document handling apparatus. 4,160,547, Cl. 271-275.000.

Bausch & Lomb Incorporated: *See*—
Dey, Thomas W.; Howe, James D.; and Letter, Eugene C., 4,161,014, Cl. 362-263.000.
Dey, Thomas W.; and Letter, Eugene C., 4,161,015, Cl. 362-263.000.

Baxter Travenol Laboratories, Inc.: *See*—
Winchell, David A., 4,160,473, Cl. 150-0.500.

Baxter, William J., to General Motors Corporation. Electrochemical measurement of fatigue damage. 4,160,702, Cl. 204-1.00T.

Bayer Aktiengesellschaft: *See*—
Lienert, Hans-Jurgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.
Lorenz, Otto, 4,160,753, Cl. 260-29.2TN.
Niederdellmann, Georg; Quiring, Bernd; and Thoma, Wilhelm, 4,160,686, Cl. 156-331.000.
Schapel, Dietmar; Wagner, Kuno; Muller, Hanns P.; and Dahm, Manfred, 4,160,754, Cl. 260-29.40R.
Schneider, Gottfried; Wagner, Kuno; and Dietrich, Werner, 4,160,749, Cl. 260-2.300.

Beach, David E., to Eastman Kodak Company. Exposure control apparatus. 4,160,588, Cl. 354-31.000.

Beech, Keith J. W., to Lucas Industries Limited. Electrical coil assembly. 4,160,967, Cl. 336-209.000.

Beelitz, Howard R.: *See*—
Hopta, Daniel F.; and Beelitz, Howard R., 4,160,943, Cl. 323-4.000.

Behringwerke Aktiengesellschaft: *See*—
Muller, Hans, 4,160,763, Cl. 260-112.00B.

Bell, John L. Stratified charge internal combustion engine. 4,160,430, Cl. 123-75.00B.

Bell, Michael. Outer shoe with gripping surface. 4,160,331, Cl. 36-59.00B.

Bell, Norman: *See*—
Andersen, John N.; and Bell, Norman, 4,160,808, Cl. 423-119.000.
Andersen, John N.; and Bell, Norman, 4,160,809, Cl. 423-119.000.

Bell, Robert R., to Vapor Corporation. Drive rod coupling for positive displacement pump. 4,160,626, Cl. 417-403.000.

Bell Telephone Laboratories, Incorporated: *See*—
Duym, Arthur, 4,160,407, Cl. 98-115.00R.
Kirsch, Howard C., 4,160,934, Cl. 315-307.000.
Seastrand, Kurt L., Jr., 4,160,952, Cl. 325-369.000.

Belov, Alexandr F.: *See*—
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.

Benfield Corporation: *See*—
Benson, Homer E.; and McCrea, Donald H., 4,160,810, Cl. 423-220.000.

Bennett, James A., to American Safety Equipment Corporation. Multipurpose battery charger. 4,160,941, Cl. 320-56.000.

Benson, Homer E.; and McCrea, Donald H., to Benfield Corporation. Removal of acid gases from hot gas mixtures. 4,160,810, Cl. 423-220.000.

Benz, Maurice E.; and Bahler, Peter, to Ciba-Geigy AG. Multi-chamber pack. 4,160,602, Cl. 366-162.000.

Berg, 0harles A., to Pyreflex Corporation. Heat recuperator. 4,160,577, Cl. 350-1.100.

Berger, Kurt: *See*—
Kudlich, Walter; Herrmann, Hans; Lechner, Gunther; and Berger, Kurt, 4,160,504, Cl. 206-334.000.

Berger, L. Joseph, Jr.; and Guequierre, Denis D., to Finite Filter Company. Method of manufacturing a coalescing demister. 4,160,684, Cl. 156-69.000.

Bergman, Roland H.; Meyer, Richard J.; and Fortman, Richard F., to Minster Machine Company, The. Transfer press having quick change die sets. 4,160,372, Cl. 72-404.000.

Berke, Herbert: *See*—
McKechnie, John C.; and Berke, Herbert, 4,160,903, Cl. 250-199.000.

Berkshire Paper Company: *See*—
Wallsten, Thomas S., 4,160,535, Cl. 248-94.000.

Berlin, Edwin P., Jr., to Massachusetts Institute of Technology. Three-dimensional display. 4,160,973, Cl. 340-718.000.

Berrer, Dagmar: *See*—
Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, 4,160,831, Cl. 424-248.560.
Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, 4,160,832, Cl. 424-248.560.

Bertini, Milo. Saw blade construction and method of making same. 4,160,397, Cl. 83-661.000.

Beseke, Kermit; and Kopecki, Ronald, to Motorola, Inc. Level control circuitry for two way communication system. 4,160,873, Cl. 178-58.00R.

Best & Donovan: *See*—
Wikoff, Mark W., 4,160,320, Cl. 30-380.000.

Bettix Limited: *See*—
Jackman, Anthony D., 4,160,381, Cl. 73-322.500.

Bexten, Eugen; Logue, Robert W.; and Wiebe, Ken J., to International Harvester Company. Auxiliary steering system. 4,160,490, Cl. 180-133.000.

Bhatia, Harsaran S.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,160,991, Cl. 357-49.000.

Bianchi, David L.: *See*—
Mais, James W.; Bianchi, David L.; and Barker, Theodore L., 4,160,351, Cl. 53-76.000.

Bianchi, Gaudenzio: *See*—
Radici, Pierino; Bianchi, Gaudenzio; and Colombo, Paolo, 4,160,789, Cl. 525-411.000.

Bichot, Bernard H.; and Gest, Rene, to Saint-Gobain Industries. Method and apparatus for manufacture of insulating sleeves. 4,160,398, Cl. 83-865.000.

Bicosa Societe de Recherches: *See*—
Courier de Mere, Henri, 4,160,920, Cl. 307-252.00C.

Biermacher, John J.: *See*—
Cho, Moo J.; and Biermacher, John J., 4,160,827, Cl. 424-199.000.

Biet, Jean-Pierre H.: *See*—
de Brebisson, Michel; Decrouen, Jean-Michel; Edlinger, Wolfgang F. J.; and Biet, Jean-Pierre H., 4,160,989, Cl. 357-44.000.

Bigotti, Alberto. Shoe cabinet. 4,160,571, Cl. 312-327.000.

Bikker, Pieter, to U.S. Philips Corporation. Power-dividing and modulating arrangement. 4,160,960, Cl. 332-40.000.

Bird, Richard A.; and Austin, Lowell W., to National Steel Corporation. Nonplating cathode and method for producing same. 4,160,703, Cl. 204-15.000.

Bishop, Larry D., to Wescom, Inc. Power regulation system for repeatered telephone transmission lines. 4,160,884, Cl. 179-170.00J.

Bishop, Raymond. Total hydraulic silage wagon. 4,160,621, Cl. 414-786.000.

Black Clawson Fibreclaim, Inc.: *See*—
Marsh, Paul G., 4,160,722, Cl. 209-4.000.

Blackstone, George H., to Arnold Industries, Inc. Apparatus for splitting wood. 4,160,472, Cl. 144-194.000.

Blake, Nathan L.; and Stelzer, Robert A., to Avco Corporation. Forage harvester and row crop attachment therefor. 4,160,355, Cl. 56-98.000.

Blakeslee, Thomas R., to Logisticon, Inc. Extended width sensor. 4,160,488, Cl. 180-168.000.

Block, Leo: *See*—
Ashton, Larry J.; and Block, Leo, 4,160,476, Cl. 165-171.000.

Bloom, Allen: *See*—
Williams, Richard; and Bloom, Allen, 4,160,816, Cl. 423-648.00R.

Bly, Vincent T., to United States of America, Army. Thermo-optical far infrared system. 4,160,907, Cl. 250-330.000.

Bobovnikov, Nikolai D.: *See*—
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.

Bock, Jan; Lundberg, Robert D.; and Makowski, Henry S., to Exxon Research & Engineering Co. Low pressure injection moldable compositions. 4,160,751, Cl. 260-23.50A.

Boeing Company, The: *See*—
White, Thomas H., 4,160,534, Cl. 244-135.00A.

Boginsky, Vladimir P.: *See*—
Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V., 4,160,486, Cl. 173-135.000.

Bojanek, Robert J.; and Mason, Marvin S., to GTE Sylvania Incorporated. Modular multiplex/demultiplex apparatus. 4,160,876, Cl. 179-15.0AT.

Bolex International S.A.: *See*—
Heiniger, Wilfred; Kreienbuehl, Claude; and Millan, Manuel, 4,160,587, Cl. 354-25.000.

Bondarev, German G.: *See*—
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., 4,160,365, Cl. 60-606.000.

Boomus, Mary; Sobin, Bernard; and Schweitzer, John, to Gelman Instrument Company. Petri dish. 4,160,700, Cl. 435-298.000.

Borden, Inc.: *See*—
Columbus, Peter S.; and Anderson, John, 4,160,750, Cl. 260-17.4ST.

Borkan, William N. Method and device for estimating fuel consumption. 4,160,376, Cl. 73-113.000.

Born, Norman E.; and Halttunen, Martin A., to General Electric Company. Semiconductor and heat sink assembly. 4,161,016, Cl. 361-388.000.

Bory, Richard A.; and Hogg, Alexander F., to Motorola, Inc. Printed wiring board mounting and interconnection of coaxial cable transformers and the like. 4,160,961, Cl. 333-27.000.

Botalam: *See*—
Joannic, Jean V., 4,160,469, Cl. 140-115.000.

Botts, Elton M., to Energy 76, Inc. Cryogenic temperature operated magnetic reciprocating motor system. 4,160,924, Cl. 310-17.000.

Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, to Bristol-Myers Company. Process for the preparation of the crystalline monohydrate of 7-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-3-methyl-3-cephem-4-carboxylic acid. 4,160,863, Cl. 544-30.000.

Bozeman, Hoyt W., Jr.: *See*—
Lindsey, Keith E.; and Bozeman, Hoyt W., Jr., 4,160,540, Cl. 254-134.3PA.

Brachthauser, Karl-Heinz: *See*—
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbek, Fritz; and Brachthauser, Karl-Heinz, 4,160,695, Cl. 435-101.000.

Brammall, Inc.: *See*—
Van Gompel, James J., 4,160,531, Cl. 242-78.100.

Branen, Kenneth E., to Avco Corporation. Method of forming a composite rod. 4,160,800, Cl. 264-345.000.

Bream, John B., to Sandoz Ltd. Amino containing benzazepines. 4,160,766, Cl. 260-243.300.

Brech, Avis, executrix: *See*—
Gromlich, Roy J.; Brech, Kilian H., deceased; and Cist, John D., 4,160,385, Cl. 73-622.000.

Brech, Kilian H., deceased: *See*—
Gromlich, Roy J.; Brech, Kilian H., deceased; and Cist, John D., 4,160,385, Cl. 73-622.000.

Brechbuhler, Hans U.: *See*—
Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, 4,160,831, Cl. 424-248.560.
Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, 4,160,832, Cl. 424-248.560.

Bredero Price, B.V.: *See*—
Scrimshaw, Martin R., 4,160,329, Cl. 33-178.00D.

Brenholdt, Irving R., to St. Regis Paper Company. Web scanning apparatus. 4,160,913, Cl. 250-563.000.

Brent Chemicals International Limited: *See*—
Brittain, Philip I.; and Lyons, Michael R. J., 4,160,375, Cl. 73-104.000.

Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Action game apparatus. 4,160,548, Cl. 273-1.00M.

Brey, William A., to Reliable Electric Company. Modular termination system for communication lines. 4,160,880, Cl. 179-98.000.

Brice, Robert D. Platform attachment. 4,160,493, Cl. 182-122.000.

Bridges, John A., to Aladdin Industries, Incorporated. Wall mounted modules for packaging, merchandising and storage. 4,160,570, Cl. 312-245.000.

Bridgestone Tire Co., Ltd.: *See*—
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.

Briggs, James B.; and Wakefield, Flake M. Lighted ornamental devices. 4,161,018, Cl. 362-104.000.

Brigham, Robert J.; Sirianni, Guy V.; and Garner, Andrew, to Placer Development Limited. Process for the production of ferromolybdenum in an electric arc furnace. 4,160,661, Cl. 75-12.000.

Brindle, Dannie K.; and Shanfelt, Donald Y., to Shanfelt, Donald Y.; Brindle, Dannie K.; Kiser, Dennis D.; Armagast, David W.; and Lynch, Patrick J., part interest to each. Inflatable solar heat collector. 4,160,443, Cl. 126-270.000.

Bristol-Myers Company: *See*—
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, 4,160,863, Cl. 544-30.000.

British Steel Corporation: *See*—
Robertson, Andrew D., 4,160,869, Cl. 13-33.000.

Brittain, Philip I.; and Lyons, Michael R. J., to Brent Chemicals International Limited. Indicator compositions. 4,160,375, Cl. 73-104.000.

Britton, Fred G.; Von Bose, Robert J.; and Keller, Cecil T., to Oil States Rubber Co. Tube closure. 4,160,612, Cl. 405-227.000.

Brody, Philip S., to United States of America, Army. Ferroelectric ceramic devices. 4,160,927, Cl. 310-302.000.

Broken Hill Proprietary Company Limited, The: *See*—
Christesen, Paul J.; and Sanders, Geoffrey R., 4,160,668, Cl. 96-1.800.

Brooks, John L.; Budziarek, Richard; and Harper, David J., to Imperial Chemical Industries Limited. Carbamates. 4,160,866, Cl. 560-25.000.

Brooks, Ray G.; and Smith, Harvell M., to Johns-Manville Corporation. Low profile heat sealing iron. 4,160,688, Cl. 156-574.000.

Bruderer AG: *See*—
Portmann, August T., 4,160,409, Cl. 100-257.000.

Brugman, Johannes A. H., to Hunter Douglas International N.V. Suspension device for a support. 4,160,344, Cl. 52-39.000.

Brunswick Corporation: *See*—
Sleder, Richard L., 4,160,435, Cl. 123-148.0CC.

Buckley, Dieter: *See*—
Weber, Adolf; Munster, Erhard; and Buckley, Dieter, 4,160,411, Cl. 102-7.000.

Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., to Research Corporation. Application of protein-protein interaction as an assay for the detection of cancer. 4,160,817, Cl. 424-1.000.

Budziarek, Richard: *See*—
Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,866, Cl. 560-25.000.

Buisker, Raymond A., to Rockford Servo Corporation. Web aligning apparatus for multi-level web material. 4,160,517, Cl. 226-19.000.

Bunker Ramo Corporation: *See*—
DeRoss, Robert W., 4,160,574, Cl. 339-99.00R.

Burkin, Jury A.: *See*—
Seleznev, Jury E.; Burkin, Jury A.; and Kuzmin, Sergei V., 4,161,037, Cl. 365-51.000.

Burrell, Charles W., deceased; and by Burrell, Mildred G., executrix. Thyristor control. 4,160,921, Cl. 307-252.00M.

Burrell, Mildred G., executrix: *See*—
Burrell, Charles W., deceased; and Burrell, Mildred G., executrix, 4,160,921, Cl. 307-252.00M.

Burroughs Corporation: *See*—
McMillan, Andrew H.; and Wisner, Daniel A., 4,160,546, Cl. 271-263.000.

Bussiere, Guy: *See*—
Huchette, Michel; and Bussiere, Guy, 4,160,849, Cl. 426-94.000.

Butler, Eric W.; and Moulds, Clinton W., III, to United States of America, Air Force. Pseudo random number generator apparatus. 4,161,041, Cl. 365-244.000.

Butter, Karl: *See—*
Tuscher, Otto; Butter, Karl; and Knauer, Kuno, 4,160,709, Cl. 204-49.000.
Cadbury India Limited: *See—*
Shenoy, Raghuram D.; and Ganapathy, Ananthram, 4,160,774, Cl. 260-424.000.
Caenazzo, Santo, to Honeywell Information Systems Italia. Paper feed mechanism for multiple copy printer. 4,160,606, Cl. 400-616.200.
Cakara, Marica; Djokic, Slobodan; and Tamburasev, Zrinka, to PLIVA Pharmaceutical and Chemical Works. 4-Dedimethylamino-4-arylsulfonamido-5a,6-anhydrotetracyclines. 4,160,783, Cl. 260-556.0AR.
Calgon Corporation: *See—*
Raman, Manjeri S., 4,160,742, Cl. 252-344.000.
Calhoun, Michael B.; and Fredd, John V., to Otis Engineering Corporation. Well tools. 4,160,478, Cl. 166-55.100.
California Instruments Corporation: *See—*
McFayden, Dennis G., 4,160,949, Cl. 324-62.000.
Camco, Incorporated: *See—*
Watkins, Fred E., 4,160,484, Cl. 166-317.000.
Camprubi, Anselmo B., to Incotex S.A. Weft selector mechanism. 4,160,468, Cl. 139-453.000.
Canaird Sales Ltd.: *See—*
Dryer, Grant M., 4,160,342, Cl. 47-80.000.
Canfield, Sheldon A.: *See—*
Carvalho, Robert L.; Canfield, Sheldon A.; and Steinbaugh, Gary, 4,160,360, Cl. 57-81.000.
Canon Kabushiki Kaisha: *See—*
Kato, Hiroaki; and Hamana, Junji, 4,161,005, Cl. 360-129.000.
Suzuki, Toyotoshi; and Matsuzaki, Kazunari, 4,160,591, Cl. 354-235.000.
Canron, Inc.: *See—*
Stewart, John K., 4,160,419, Cl. 104-10.000.
Cantor, Paul A.: *See—*
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,160,791, Cl. 525-469.000.
Carl Schenck AG: *See—*
Guyot, Volker; Maus, Otfrid; and Muller, Martin, 4,160,384, Cl. 73-462.000.
Carol, John A., Jr., to General Motors Corporation. Mileage switch and latch means. 4,160,900, Cl. 235-132.00E.
Carr, Stephen H.; and Stupp, Samuel I., to Northwestern University. Process for preparing polyacrylonitrile doped with Prussion blue. 4,160,760, Cl. 260-42.210.
Carriere, Victor, to Bach-Simpson Limited. Power measuring apparatus for ultrasonic transducers. 4,160,388, Cl. 73-646.000.
Caruso, Patsy. Circular to chain saw conversion apparatus. 4,160,319, Cl. 30-122.000.
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Farmer, Stanley E.; and Weinert, Harry F., 4,160,620, Cl. 414-621.000.
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Papasideris, Stamos I., 4,160,916, Cl. 307-10.00R.
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Choe, Eui W.; Tan, Marshall; and Mininni, Robert M., 4,160,755, Cl. 260-29.60H.
Taylor, Paul D., 4,160,771, Cl. 260-346.110.
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Josis, Christian; and Hans, Andre, 4,160,725, Cl. 210-21.000.
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Thornton, Alfred K.; and Cerone, Frank E., 4,160,910, Cl. 250-432.0PD.
Cerwin, Steve A.: *See—*
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.
Champion International Corporation: *See—*
Gorham, Jack C., 4,160,519, Cl. 229-37.00R.
Roccaforte, Harry I., 4,160,502, Cl. 206-45.140.
Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Asymmetric synthesis. 4,160,865, Cl. 560-22.000.
Chapman, Harvey A.; Fowler, John S.; Huang, John C. P.; and Leslie, James B., to Minnesota Mining and Manufacturing Company. Interior storm window construction. 4,160,348, Cl. 52-202.000.
Chard, Gerald L. P.; Haupt, Joachim; and Zuber, Werner, to Motorola, Inc. Apparatus for indicating the position of rotating mechanical elements. 4,160,890, Cl. 200-308.000.
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Edwards, Laroy H., 4,160,845, Cl. 424-298.000.
Lavigne, Joe B., 4,160,770, Cl. 260-343.30P.
Lewis, Robert A.; and Honnen, Lewis R., 4,160,648, Cl. 44-63.000.
Soutar, David, Jr.; Feffer, Philip C.; and Guenther, Lloyd M., 4,160,307, Cl. 28-220.000.
Wilcox, Ralph S., 4,160,729, Cl. 210-40.000.
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibatani, Takeji; and Nishimura, Noriyuki, to Tanabe Seiyaku Co., Ltd. Method for purification of crude urokinase. 4,160,697, Cl. 435-194.000.
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Sendov, Stoyan H.; Evtimov, Stoyan I.; Nikolov, van A.; Kuklin, Ivan A.; Mirchev, Mircho G.; and Dimov, NikolasS., 4,160,647, Cl. 422-106.000.
Chittenden, Richard M., to Abbott Laboratories. Unidirectional catheter placement unit. 4,160,451, Cl. 128-214.400.
Cho, Moo J.; and Biermacher, John J., to Upjohn Company, The. Metronidazole phosphate and salts. 4,160,827, Cl. 424-199.000.
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Christesen, Paul J.; and Sanders, Geoffrey R., to Broken Hill Proprietary Company Limited, The; and Lysaght Durham Chemical Company Proprietary Limited, The. Electrophotographic grade zinc oxide. 4,160,668, Cl. 96-1.800.
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Knupp, Dwight A., 4,160,379, Cl. 73-229.000.
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Tomioka, Michiaki, 4,160,401, Cl. 84-1.160.
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Benz, Maurice E.; and Bahler, Peter, 4,160,602, Cl. 366-162.000.
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Diel, Peter J., 4,160,833, Cl. 424-249.000.
Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, 4,160,831, Cl. 424-248.560.
Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, 4,160,832, Cl. 424-248.560.
Maier, Ludwig, 4,160,779, Cl. 260-502.500.
Paioni, Romeo, 4,160,837, Cl. 424-267.000.
Renner, Alfred; and Zahir, Abdul-Cader, 4,160,859, Cl. 528-322.000.
Schmidt, Andreas; and Kirchmayr, Rudolf, 4,160,794, Cl. 260-927.00R.
Szczepanski, Henry, 4,160,843, Cl. 424-278.000.
Vogel, Christian; and Aebi, Rudolf, 4,160,660, Cl. 71-118.000.
Cincinnati Milacron, Inc.: *See—*
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,160,819, Cl. 424-45.000.
Cist, John D.: *See—*
Gromlich, Roy J.; Brech, Kilian H., deceased; and Cist, John D., 4,160,385, Cl. 73-622.000.
Citizen Watch Company Limited: *See—*
Nakayama, Toshihiko; and Takei, Kenji, 4,160,928, Cl. 310-353.000.
Claggett, Joseph H. Mounting arrangement for a television monitoring camera. 4,160,999, Cl. 358-108.000.
Clare-Pendar Co.: *See—*
Wright, Duane H., deceased; and Meyer, Stephen F., 4,160,886, Cl. 200-5.00A.
Classic Products Corporation: *See—*
Fogel, Isaac, 4,160,296, Cl. 5-285.000.
Cleary, Frederick W.: *See—*
Ladd, Glenn O., Jr.; and Cleary, Frederick W., 4,160,984, Cl. 357-22.000.
Cleland, Robert K. Liquid metering and blending means. 4,160,512, Cl. 222-56.000.
Cleveland, Robert R., to Video Systems Research, Inc. High speed television camera control system. 4,161,000, Cl. 358-225.000.
Cline, Harvey E.: *See—*
Houston, Douglas E.; Cline, Harvey E.; and Anthony, Thomas R., 4,160,679, Cl. 148-1.500.
Cluthe, George J., to Geo. Cluthe Manufacturing Co. Limited, The. Rural mail box. 4,160,520, Cl. 232-17.000.
Coal Industry (Patents) Limited: *See—*
Monks, Harry, 4,160,391, Cl. 74-661.000.
Cockerham, Terry L. Toothpaste dispenser. 4,160,513, Cl. 222-181.000.
Codex Corporation: *See—*
Vander Mey, James E., 4,160,877, Cl. 179-15.0BA.
Codman & Shurtleff, Inc.: *See—*
Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., 4,160,857, Cl. 429-97.000.
Colburn, Edward N., to UOP Inc. Portable water sampling apparatus. 4,160,622, Cl. 417-181.000.
Cole, Clinton W., to Halliburton Company. Hydraulically powered triplex pump and control system therefor. 4,160,627, Cl. 417-403.000.
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Cole, Lewis C., to United States of America, Army. Target activated projectile. 4,160,415, Cl. 102-214.000.
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Columbus, Peter S.; and Anderson, John, to Borden, Inc. Aqueous acrylic contact cement. 4,160,750, Cl. 260-17.4ST.
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Nigra, Jacques; and Vanthuyne, Guy, 4,160,996, Cl. 358-73.000.
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Dahy, Jean-Jacques; and Hubert, Maurice, 4,161,025, Cl. 364-200.000.
Compagnie Neerlandaise de l'Azote: *See—*
Van Hijfte, Willy Henri P.; and Goethals, Rafael Arsene J., 4,160,782, Cl. 260-555.00C.

Comstock, Theodore R.: *See*—
Smith, Gordon S.; and Comstock, Theodore R., 4,160,304, Cl. 16-49.000.

Conard, Donald D. Suitcase with transporting rims. 4,160,495, Cl. 190-18.00A.

Conroy, Edward H.; and Gloster, Arthur, to Texasgulf Inc. Multi-stage crystallization of sodium carbonate. 4,160,812, Cl. 423-421.000.

Conroy, Peter J., to Motorola, Inc. Broadband microstrip disc antenna. 4,160,976, Cl. 343-700.0MS.

Cooke, Claude E., Jr.: *See*—
Erbstoesser, Steven R.; Muecke, Thomas W.; and Cooke, Claude E., Jr., 4,160,482, Cl. 166-284.000.

Cooney, Robert M., to Apollo Spinner, Inc. Skateboard accessory. 4,160,554, Cl. 280-87.04A.

Cope, Lloyd S.; and Rejda, Ladislav J., to Epoxylite Corporation, The. Materials and impregnating compositions for insulating electric machines. 4,160,926, Cl. 310-215.000.

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Ito, Kenzo; and Abe, Yoshiharu, 4,160,595, Cl. 355-3.0FU.

Corn, John E.: *See*—
Webb, Jimmy L.; and Corn, John E., 4,160,785, Cl. 260-583.00P.

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Bartholomew, Roger F.; Mach, Joseph F.; and Wu, Che-Kuang, 4,160,654, Cl. 65-30.00E.
Kingsbury, Paul I., Jr.; and Seward, Thomas P., III, 4,160,655, Cl. 65-30.00R.
Potts, Robert S., 4,160,803, Cl. 422-101.000.

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Sullivan, Ronald L.; and Cosentino, Ronald R., 4,160,879, Cl. 179-90.0AN.

Courier de Mere, Henri, to Bicosa Societe de Recherches. Bistable element and a switch circuit comprising such a bistable element. 4,160,920, Cl. 307-252.00C.

Courtney, Thomas; and Lumba, Vijay K., to Fairchild Camera and Instrument Corporation. Optically coupled isolator device and method of making same. 4,160,308, Cl. 29-588.000.

Covington, Wayne F.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.

CPC Engineering Corporation: *See*—
Reid, Robert A., 4,160,569, Cl. 308-203.000.

Craib, Rupert G. Floor joist plate. 4,160,350, Cl. 52-696.000.

Crestetto, Giovanni. Automotive bumper. 4,160,562, Cl. 293-120.000.

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Mulot, Georges C., 4,160,395, Cl. 82-5.000.

Cross, Thomas A.: *See*—
Fastaia, Anthony J.; and Cross, Thomas A., 4,160,373, Cl. 73-23.000.

Crumby, John T. Two-stage flush mechanism for toilets. 4,160,294, Cl. 4-324.000.

Crump, Janet M.: *See*—
Crump, Terence J.; and Crump, Janet M., 4,160,374, Cl. 73-76.000.

Crump, Terence J.; and Crump, Janet M. Apparatus for measuring the diffusive resistance of plant stomata. 4,160,374, Cl. 73-76.000.

Crumpacker, William H. Wrench. 4,160,394, Cl. 81-64.000.

Cunningham, Francis V., to Joslyn Mfg. and Supply Co. High voltage protection apparatus. 4,161,012, Cl. 361-128.000.

Curran, Matthew J.: *See*—
Arendt, Ronald H.; and Curran, Matthew J., 4,160,705, Cl. 204-37.00R.
Arendt, Ronald H.; and Curran, Matthew J., 4,160,706, Cl. 204-37.00R.
Arendt, Ronald H.; and Curran, Matthew J., 4,160,708, Cl. 204-37.00R.

Curtice, Walter R., to RCA Corporation. Exclusive-OR circuit. 4,160,919, Cl. 307-216.000.

Curtis, Robert S. Fuel system for aquatic craft. 4,160,425, Cl. 115-6.100.

Daborowski, Ignace J.; and Galis, Leon A., to Ambac Industries, Inc. Excess fuel starting device for fuel injection engines. 4,160,434, Cl. 123-140.0FG.

Dahm, Manfred: *See*—
Schapel, Dietmar; Wagner, Kuno; Muller, Hanns P.; and Dahm, Manfred, 4,160,754, Cl. 260-29.40R.

Dahy, Jean-Jacques; and Hubert, Maurice, to Compagnie Internationale pour l'Informatique. Information processing system. 4,161,025, Cl. 364-200.000.

Dainichi-Nippon Cables, Ltd.: *See*—
Tanno, Shogo; and Hirose, Masateru, 4,160,947, Cl. 324-54.000.

Daiwa Shinku Corporation: *See*—
Ueda, Hirotada, 4,160,583, Cl. 350-269.000.
Yasuo, Sasaki, 4,160,582, Cl. 350-269.000.

Dalziel, Warren L., to Shugart Associates. Head positioning mechanism for recording/playback machine. 4,161,004, Cl. 360-106.000.

D'Amico, John J., to Monsanto Company. Substituted benzothiazolines and their use as plant growth regulants. 4,160,658, Cl. 71-90.000.

Damm, Jerry S.; and Damm, William R. Photographic easel. 4,160,597, Cl. 355-74.000.

Damm, William R.: *See*—
Damm, Jerry S.; and Damm, William R., 4,160,597, Cl. 355-74.000.

Damouth, David E.; and Gunning, William F., to Xerox Corporation. Motor speed control system. 4,160,939, Cl. 318-723.000.

Dan River Incorporated: *See*—
Newell, Robert C.; and Kinning, Robert F., 4,160,424, Cl. 112-275.000.

Danfoss A/S: *See*—
Dyhr, Jan; and Nissen, Ole J., 4,160,625, Cl. 417-363.000.

Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., to General Electric Company. Anatomically coordinated user dominated programmer for diagnostic x-ray apparatus. 4,160,906, Cl. 250-322.000.

Dankman, Scott; Levy, Richard C.; and McCoy, Bryan. Toy flying vehicle including sound effect generator. 4,160,339, Cl. 46-232.000.

Daravingas, George V.: *See*—
Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., 4,160,850, Cl. 426-601.000.
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,820, Cl. 424-48.000.

Davey, Julian P., to Kratos Limited. Electron microscopes. 4,160,905, Cl. 250-311.000.

David Sensibar Irrevocable Trust: *See*—
Sensibar, Ezra, 4,160,618, Cl. 414-142.000.

Davis, Frederick B., 3rd; and Ross, Charles W., to Leeds & Northrup Company. Electric demand control system. 4,161,028, Cl. 364-492.000.

Davis, Ross A. Automobile antenna. 4,160,977, Cl. 343-713.000.

Davis, Steven S., to Envirotech Corporation. Pulp washer. 4,160,297, Cl. 8-156.000.

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Geyken, Erwin; and Dawidowitsch, Peter, 4,160,594, Cl. 354-324.000.

De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See*—
van Wijngaarden, Hans, 4,160,902, Cl. 250-461.00R.

de Brebisson, Michel; Decrouen, Jean-Michel; Edlinger, Wolfgang F. J.; and Biet, Jean-Pierre H., to U.S. Philips Corporation. Integrated circuit having complementary bipolar transistors. 4,160,989, Cl. 357-44.000.

Decrouen, Jean-Michel: *See*—
de Brebisson, Michel; Decrouen, Jean-Michel; Edlinger, Wolfgang F. J.; and Biet, Jean-Pierre H., 4,160,989, Cl. 357-44.000.

Degols, Albert: *See*—
Tytgat, Daniel; and Degols, Albert, 4,160,948, Cl. 324-61.00P.

de Jong, Eduard B. M., to Technicon Instruments Corporation. Regenerating a degenerated curve. 4,161,030, Cl. 364-581.000.

de Keyser, Andre; and Seynaeve, Laurent, to Sprague Electric Company. Dual section distributed parameter delay-line. 4,160,962, Cl. 333-141.000.

DelPico, Joseph, to Abcor, Inc. Ultrafiltration process for the concentration of polymeric latices. 4,160,726, Cl. 210-23.00F.

Demircioglu, Sayman F.: *See*—
Zimmermann, Detlef; Demircioglu, Sayman F.; and Kugler, Jindrich, 4,161,008, Cl. 361-56.000.

Demuth, Hans; and Stumpp, Walter, to Sulzer Brothers, Ltd. Knot hole beam. 4,160,532, Cl. 242-125.100.

DeNicola, Joseph P., to Instron Corporation. Extensometer. 4,160,325, Cl. 33-148.00D.

Denison, Early B.: *See*—
Dickson, Leon L., Jr.; and Denison, Early B., 4,160,457, Cl. 134-167.00C.

Dennard, Robert H.; and Rideout, Vincent L., to International Business Machines Corporation. Field effect transistors with polycrystalline silicon gate self-aligned to both conductive and non-conductive regions and fabrication of integrated circuits containing the transistors. 4,160,987, Cl. 357-41.000.

Derner, William J.; and Price, Connor E., to FMC Corporation. Preloading nut for wedge sleeve. 4,160,608, Cl. 403-370.000.

DeRoss, Robert W., to Bunker Ramo Corporation. Connector for flat wire cables having improved contacts and integral strain relief means. 4,160,574, Cl. 339-99.00R.

DeSchutter, Camiel R. Insulating modular panel units. 4,160,349, Cl. 52-481.000.

DeShano, Al. Capsule for a life saving line and float. 4,160,298, Cl. 9-14.000.

Desiderio, Fred A., to Rohm and Haas Company. Method for preparing dye solutions. 4,160,642, Cl. 8-12.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Automatic sequence generator for a polyphonic tone synthesizer. 4,160,399, Cl. 84-1.030.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Junkermann, Helmut, 4,160,656, Cl. 71-21.000.

Dey, Thomas W.; Howe, James D.; and Letter, Eugene C., to Bausch & Lomb Incorporated. Luminaire having a configured interference mirror and reflector. 4,161,014, Cl. 362-263.000.

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Diamond Shamrock Corporation: *See*—
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,160,768, Cl. 260-306.70T.
Wiseman, Russell M., 4,160,716, Cl. 204-270.000.

DiBona, Anthony, Jr. Tuna and egg-salad mixer. 4,160,604, Cl. 366-247.000.

Dicesare, Pierre: *See*—
Moll, Manfred; Flayeux, Roland; Dicesare, Pierre; and Gross, Bernard, 4,160,787, Cl. 260-586.00D.

Dickson, Leon L., Jr.; and Denison, Early B., to Shell Oil Company. Tool joint cleaner. 4,160,457, Cl. 134-167.00C.

Diehl: *See*—
Weber, Adolf; Munster, Erhard; and Buckley, Dieter, 4,160,411, Cl. 102-7.000.

Diel, Peter J., to Ciba-Geigy Corporation. 1,2,4-Benzotriazine-1,4-di-N-oxide derivatives. 4,160,833, Cl. 424-249.000.
Diembeck, Walter: *See—*
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Dieterich, Dieter: *See—*
Lienert, Hans-Jurgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.
Dietrich, Werner: *See—*
Schneider, Gottfried; Wagner, Kuno; and Dietrich, Werner, 4,160,749, Cl. 260-2.300.
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbek, Fritz; and Brachthauser, Karl-Heinz, to Projektierung Chemische Verfahrenstechnik Gesellschaft mit beschrankter Haftung. Process for the production of glucose from cellulose-containing vegetable raw materials. 4,160,695, Cl. 435-101.000.
Dikinis, Daumantas V. Automatic car identification system. 4,160,522, Cl. 235-454.000.
Dill, Herbert C.; and Wisler, Allen E., to Hughes Tool Company. Heat treatment of welds. 4,160,543, Cl. 266-252.000.
Dimension Weld International Corporation, The: *See—*
Kuroda, Minoru, 4,160,685, Cl. 156-219.000.
Dimov, NikolasS.: *See—*
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Displaytek Corporation: *See—*
Ueda, Hirotada, 4,160,583, Cl. 350-269.000.
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Dr. Johannes Heidenhain GmbH: *See—*
Ernst, Alfons, 4,160,328, Cl. 33-125.00R.
Doherty, George O. Outside-the-needle catheter device with needle housing. 4,160,450, Cl. 128-214.400.
Dominion Engineering Works Limited: *See—*
Futcher, Ralph J., 4,160,694, Cl. 162-256.000.
Domtar Inc.: *See—*
Lapointe, Joseph A., 4,160,471, Cl. 144-176.000.
Nguyen, Xuan T., 4,160,730, Cl. 210-48.000.
Dorner, Armin; and Kreuter, Walter, to Linde Aktiengesellschaft. Tube furnace for the cracking of organic feed stock. 4,160,701, Cl. 196-116.000.
Dotson, Ronald L.: *See—*
Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,160,704, Cl. 204-32.00R.
Dow Chemical Company, The: *See—*
Sweet, Forest H., III, 4,160,740, Cl. 252-75.000.
Thomas, Ronnie L.; and Suhy, Frederick A., 4,160,483, Cl. 166-307.000.
Doyle, Carlos L., to American Cyanamid Company. Process for dewatering sewage sludges disinfected with lime. 4,160,731, Cl. 210-50.000.
Drake, James A. Garden canopy. 4,160,341, Cl. 47-28.00R.
Drayer, T. Gary: *See—*
Hawkins, Robert W.; Togami, Paul G.; and Drayer, T. Gary, 4,160,456, Cl. 130-27.00T.
Drechsel, Erhart K., to Pennzoil Company. Preparation of monocalcium phosphate and phosphoric acid. 4,160,657, Cl. 71-41.000.
Drewett, Robert J., to National Research Development Corporation. Helical radio antennae. 4,160,979, Cl. 343-788.000.
Driessen, Antonius J. G. C.; and Vos, Hendricus E. M. C., to U.S. Philips Corporation. Electric discharge lamp with annular current conductor. 4,160,930, Cl. 313-217.000.
Driver, Michael L. Double diaphragm electrostatic transducer each diaphragm comprising two plastic sheets having different charge carrying characteristics. 4,160,882, Cl. 179-111.00R.
Dryer, Grant M., to Canaird Sales Ltd. Pots for growing plants. 4,160,342, Cl. 47-80.000.
D'Silva, Thomas L., to Western Gold & Platinum Co. Ductile brazing foil for cast superalloys. 4,160,854, Cl. 428-607.000.
DuHamel, Raymond H. Circularly polarized loop and helix panel antennas. 4,160,978, Cl. 343-742.000.
Dunn, Cecil C. Tool for layout of baseball diamonds (Du-Ber). 4,160,324, Cl. 33-137.00R.
Dunne, Carroll J., Jr.; and Scott, Ian J. C., to Chrysler Corporation. Pump enclosed fluid flowmeter. 4,160,380, Cl. 73-229.000.
Du Pont de Nemours, E. I., and Company: *See—*
Gromlich, Roy J.; Brech, Kilian H., deceased; and Cist, John D., 4,160,385, Cl. 73-622.000.
Kirkland, Joseph J.; and Yau, Wallace W., 4,160,728, Cl. 210-31.00C.
Krespan, Carl G., 4,160,780, Cl. 260-513.00F.
Duro-Test Corporation: *See—*
Thorington, Luke; Walsh, Peter; Koo, Ronald; and Thouret, Wolfgang, 4,160,929, Cl. 313-112.000.
Duthie, Anthony J.: *See—*
Hirst, Peter B.; and Duthie, Anthony J., 4,160,302, Cl. 15-340.000.
Duym, Arthur, to Bell Telephone Laboratories, Incorporated. Ventilating system. 4,160,407, Cl. 98-115.00R.
Dyhr, Jan; and Nissen, Ole J., to Danfoss A/S. Encapsulated refrigerator. 4,160,625, Cl. 417-363.000.
Dzugutov, Mikhail Y.: *See—*
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.
E.M.F., Inc.: *See—*
Griesbach, Melbourne L., 4,160,326, Cl. 33-174.00R.
E M I Limited: *See—*
Froggatt, Robert J., 4,160,909, Cl. 250-402.000.
Hounsfield, Godfrey N., 4,160,911, Cl. 250-445.00T.
Hounsfield, Godfrey N.; and Gillard, Richard G., 4,160,954, Cl. 328-127.000.
E. R. Squibb & Sons, Inc.: *See—*
Varma, Ravi K., 4,160,772, Cl. 260-397.100.
E. & U. Gertsch AG: *See—*
Gertsch, Ulrich, 4,160,556, Cl. 280-618.000.
East, Harvey J., to Aurifex Limited. Jewelry bracelets. 4,160,361, Cl. 59-82.000.
Eastman Kodak Company: *See—*
Beach, David E., 4,160,588, Cl. 354-31.000.
Locey, Mark M.; and Gottermeier, William F., 4,160,799, Cl. 264-342.00R.
McCabe, John M.; and Yoerger, William E., 4,160,666, Cl. 96-1.0PC.
Ponticello, Ignazio S.; and McIntire, John M., 4,160,864, Cl. 560-2.000.
Rosenburgh, Norman J., 4,160,593, Cl. 354-317.000.
Wu, Tai-Wing, 4,160,696, Cl. 435-25.000.
Ebner, Peter R., to Itek Corporation. Backlashless phototypesetter carriage brake. 4,160,586, Cl. 354-5.000.
Edgell, Thomas A.: *See—*
Snyer, William H.; Williams, Ralph E.; and Wisotski, John, 4,160,412, Cl. 102-20.000.
Edlinger, Wolfgang F. J.: *See—*
de Brebisson, Michel; Decrouen, Jean-Michel; Edlinger, Wolfgang F. J.; and Biet, Jean-Pierre H., 4,160,989, Cl. 357-44.000.
Edwards, Laroy H., to Chevron Research Company. Fungicidal N-(haloaliphaticthio)halovinylsulfonamides. 4,160,845, Cl. 424-298.000.
Ehlscheid, Gunter: *See—*
Stemmler, Kurt; Langenbeck, Peter; and Ehlscheid, Gunter, 4,160,894, Cl. 219-121.00L.
Ehmann, William J., to SCM Corporation. Process for isomerizing cycloalkenol to cycloalkanone. 4,160,786, Cl. 260-586.00P.
Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephan, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Synthetic alkyl esters of phospholipid acid, structural analogs thereof and a process for their manufacture and their use. 4,160,773, Cl. 260-403.000.
Electric Power Research Institute, Inc.: *See—*
Russell, Billy D., 4,161,027, Cl. 364-492.000.
Eli Lilly and Company: *See—*
Miesel, John L., 4,160,834, Cl. 424-250.000.
Miller, Jean C.; and Gutowski, Gerald E., 4,160,767, Cl. 260-244.400.
Ellicott, Harold B.; and Frank, James P., to General Electric Company. Electrical switch and method of operation. 4,160,885, Cl. 200-1.00R.
Emerson Electric Co.: *See—*
Saini, Sarmukh S., 4,160,968, Cl. 337-404.000.
Endo, Isamu: *See—*
Mori, Haruo; Ueda, Tadashige; and Endo, Isamu, 4,160,364, Cl. 60-293.000.
Endo, Shinichiro: *See—*
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,160,901, Cl. 235-437.000.
Energy 76, Inc.: *See—*
Botts, Elton M., 4,160,924, Cl. 310-17.000.
Engel, John F., to FMC Corporation. Insecticidal [β-(substituted-phenyl)vinyl]cyclopropanecarboxylates. 4,160,842, Cl. 424-274.000.
Engineering Enterprises, Inc.: *See—*
Nixon, Jeddy D.; and Fox, Fred K., 4,160,551, Cl. 277-124.000.
English, William D.: *See—*
Neff, Joseph A.; and English, William D., 4,160,811, Cl. 423-276.000.
Envirotech Corporation: *See—*
Davis, Steven S., 4,160,297, Cl. 8-156.000.
Epoxylite Corporation, The: *See—*
Cope, Lloyd S.; and Rejda, Ladislav J., 4,160,926, Cl. 310-215.000.
Erbstoesser, Steven R.; Muecke, Thomas W.; and Cooke, Claude E., Jr., to Exxon Production Research Company. Ball sealer diversion of matrix rate treatments of a well. 4,160,482, Cl. 166-284.000.
Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Segmented longitudinal measuring device. 4,160,328, Cl. 33-125.00R.
Esseluhn, Werner F., to Western Electric Co., Inc. Depositing materials on stacked semiconductor wafers. 4,160,682, Cl. 148-171.000.
Etablissements Francois Salomon et Fils: *See—*
Salomon, Georges P. J., 4,160,332, Cl. 36-119.000.
Etudes et Recherches Avancees: *See—*
Galicher, Georges, 4,160,497, Cl. 192-4.00A.
Etudes Techniques et Representations Industrielles E.T.R.I.: *See—*
Vettori, Claude, 4,160,576, Cl. 339-119.00R.
Evtimov, Stoyan I.: *See—*
Sendov, Stoyan H.; Evtimov, Stoyan I.; Nikolov, van A.; Kuklin, Ivan A.; Mirchev, Mircho G.; and Dimov, NikolasS., 4,160,647, Cl. 422-106.000.
Exxon Production Research Company: *See—*
Erbstoesser, Steven R.; Muecke, Thomas W.; and Cooke, Claude E., Jr., 4,160,482, Cl. 166-284.000.
Rickenbacker, James E., 4,160,922, Cl. 307-261.000.

Exxon Research & Engineering Co.: *See*—
Bock, Jan; Lundberg, Robert D.; and Makowski, Henry S., 4,160,751, Cl. 260-23.50A.
Gardner, Irwin J., 4,160,758, Cl. 260-40.00R.
Gardner, Irwin J.; and Baldwin, Francis P., 4,160,759, Cl. 260-40.00R.
Murrell, Lawrence L.; and Yates, David J. C., 4,160,745, Cl. 252-466.00J.

F. A. Malone & Son, Inc.: *See*—
Malone, Fermer A., Sr.; and Malone, Fermer A., Jr., 4,160,528, Cl. 242-56.00R.

F. D. Farnam Co.: *See*—
Farnam, Robert G.; and Lomik, Alexander, 4,160,561, Cl. 293-1.000.

Fader, Walter J., to United Technologies Corporation. Nuclear-pumped uranyl salt laser. 4,160,956, Cl. 331-94.50P.

Fairchild Camera and Instrument Corporation: *See*—
Courtney, Thomas; and Lumba, Vijay K., 4,160,308, Cl. 29-588.000.

Farmer, Stanley E.; and Weinert, Harry F., to Cascade Corporation. Lift truck paper roll clamp having improved contact pad restraint and hinge structure. 4,160,620, Cl. 414-621.000.

Farnam, Robert G.; and Lomik, Alexander, to F. D. Farnam Co. Vehicle bumper shim and method. 4,160,561, Cl. 293-1.000.

Farrell, Joseph S.: *See*—
Badolato, Anthony; and Farrell, Joseph S., 4,160,801, Cl. 422-46.000.

Fastaia, Anthony J.; and Cross, Thomas A., to United Technologies Corporation. Vehicle exhaust gas analysis system with gas blockage interlock. 4,160,373, Cl. 73-23.000.

Fava, Ronald A., to Arco Polymers, Inc. Thermoplastic molding composition comprising styrene-maleimide and polycarbonate. 4,160,792, Cl. 525-148.000.

Federal Paper Board Company, Inc.: *See*—
Ganz, Robert H., 4,160,353, Cl. 53-393.000.

Feeney, Joseph D.: *See*—
Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., 4,160,857, Cl. 429-97.000.

Feffer, Philip C.: *See*—
Soutar, David, Jr.; Feffer, Philip C.; and Guenther, Lloyd M., 4,160,307, Cl. 28-220.000.

Felix Stiegler Maschinenfabrik: *See*—
Matzner, Peter; and Schulze, Ehrhart, 4,160,396, Cl. 83-100.000.

Ferranti Limited: *See*—
Kane, Jeffrey, 4,160,990, Cl. 357-48.000.
Law, James T., 4,160,455, Cl. 128-400.000.

Fey, Maurice G.; and Harvey, Francis J., II, to Westinghouse Electric Corp. Method and apparatus for melting machining chips. 4,160,867, Cl. 13-2.00P.

Fiber Mechanics AB: *See*—
Lindgren, Mats, 4,160,521, Cl. 233-27.000.

Fichter, Robert, to Norwood Marking & Equipment Co. Marking device utilizing dual rod power cylinder. 4,160,410, Cl. 101-41.000.

Finite Filter Company: *See*—
Berger, L. Joseph, Jr.; and Guequierre, Denis D., 4,160,684, Cl. 156-69.000.

Finsterwalder, Lorenz; Zeh, Horst; and Schaarschmidt, Ulrich, to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH. Sample taking device for toxic and/or radioactive substances. 4,160,382, Cl. 73-422.00R.

Fiorini, Antonio. Process for the control of the forward speed of workpieces. 4,160,937, Cl. 318-39.000.

Firester, Arthur H.; and Heller, Macy E., to RCA Corporation. Apparatus for the determination of focused spot size and structure. 4,160,598, Cl. 356-121.000.

Fischer, Artur. Hollow structural element for assembling a structure. 4,160,337, Cl. 46-26.000.

Fischetti, Ignazio, to Laboratory Biochimici Fargal-Pharmasint S.p.A. Inhibitor preparation for the absorption of lipids, based on diethylaminoethyldextran. 4,160,826, Cl. 424-180.000.

Fisher, Bruce S.: *See*—
Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., 4,160,791, Cl. 525-469.000.

Fisons Limited: *See*—
Orr, Thomas S. C.; and Keogh, Raymond W., 4,160,844, Cl. 424-283.000.

Flach, Wayne T.: *See*—
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.

Flanagan, Paul, to Flynn Burner Corporation. Liquid fuel atomizing nozzle. 4,160,526, Cl. 239-427.000.

Flayeux, Roland: *See*—
Moll, Manfred; Flayeux, Roland; Dicesare, Pierre; and Gross, Bernard, 4,160,787, Cl. 260-586.00D.

Fleckenstein, Erwin: *See*—
Mischke, Peter; Fleckenstein, Erwin; and Mohr, Reinhard, 4,160,764, Cl. 260-206.000.

Fleischer, Henry. Child holding device and joint therefor. 4,160,553, Cl. 280-87.02W.

Fletcher, James D. Archery bow string release device. 4,160,437, Cl. 124-35.00A.

Flood, Paul W.: *See*—
Mason, Charles D.; and Flood, Paul W., 4,160,790, Cl. 525-179.000.

Flower, Ralph F. J. Rotary valves. 4,160,436, Cl. 123-190.00B.

Flynn Burner Corporation: *See*—
Flanagan, Paul, 4,160,526, Cl. 239-427.000.

FMC Corporation: *See*—
Derner, William J.; and Price, Connor E., 4,160,608, Cl. 403-370.000.
Engel, John F., 4,160,842, Cl. 424-274.000.

Fogel, Isaac, to Classic Products Corporation. Waterbed headboard bracket. 4,160,296, Cl. 5-285.000.

Fong, Godfrey T.: *See*—
Kamins, Theodore I.; and Fong, Godfrey T., 4,160,985, Cl. 357-30.000.

Fonteneau, Norman O.: *See*—
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.

Ford Motor Company: *See*—
Lambe, John J.; and McCarthy, Shaun L., 4,160,931, Cl. 313-498.000.
McLean, Douglas H., 4,160,485, Cl. 172-9.000.

Foremost-McKesson, Inc.: *See*—
Harris, Robert M., Jr., 4,160,727, Cl. 210-23.00H.

Fortman, Richard F.: *See*—
Bergman, Roland H.; Meyer, Richard J.; and Fortman, Richard F., 4,160,372, Cl. 72-404.000.

Foster, Stephen R.: *See*—
Akkerman, Neil H.; Foster, Stephen R.; and Goans, Kip B., 4,160,463, Cl. 137-596.180.

Foux, Amnon, to University of Utah. Implantable catheter system. 4,160,454, Cl. 128-348.000.

Fowler, John S.: *See*—
Chapman, Harvey A.; Fowler, John S.; Huang, John C. P.; and Leslie, James B., 4,160,348, Cl. 52-202.000.

Fowler, Ronald J., to United States of America, Navy. Arming-safing system for airborne weapons. 4,160,417, Cl. 102-221.000.

Fox, Charles T.; and Graham, Edward P., to United States Stove Company. Fireplace cover. 4,160,442, Cl. 126-140.000.

Fox, Fred K.: *See*—
Nixon, Jeddy D.; and Fox, Fred K., 4,160,551, Cl. 277-124.000.

Frank, James P.: *See*—
Ellicott, Harold B.; and Frank, James P., 4,160,885, Cl. 200-1.00R.

Franz, Curtis A., to American Cyanamid Company. Benzothiazole accelerators stabilized with oxirane compounds. 4,160,741, Cl. 252-182.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,160,418, Cl. 104-2.000.

Frazier, Paul D. Method of constructing an orthodontic appliance. 4,160,322, Cl. 32-14.00C.

Fredd, John V.: *See*—
Calhoun, Michael B.; and Fredd, John V., 4,160,478, Cl. 166-55.100.

Frei, Ernst. Clothes hanger. 4,160,515, Cl. 223-96.000.

Frentress, Zane, to Milliken Research Corporation. Random signal generator for the manufacture of slub open end spun yarn. 4,160,359, Cl. 57-58.890.

Fridy, Levi G., to United States of America, Navy. Degraining, a three step process to obtain propellant samples from case bonded motors. 4,160,314, Cl. 29-558.000.

Friederich, Klaus: *See*—
Lienert, Hans-Jurgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.

Frigato, Giovanni, to Sandoz Ltd. Device for measuring conductivity of a solution. 4,160,946, Cl. 324-30.00R.

Fritsch, Robert A., to Harnischfeger Corporation. Carrier frame for mobile crane. 4,160,558, Cl. 280-797.000.

Froggatt, Robert J., to E M I Limited. X-ray tube arrangements. 4,160,909, Cl. 250-402.000.

Frye, George J.; and Geerling, Leonardus J. Automatic transient response analyzer system. 4,161,029, Cl. 364-579.000.

Fugono, Takeshi: *See*—
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,160,830, Cl. 424-246.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Mori, Haruo; Ueda, Tadashige; and Endo, Isamu, 4,160,364, Cl. 60-293.000.

Fujimori, Noboru: *See*—
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, 4,160,669, Cl. 96-27.00E.

Fujimori, Ryo; and Ito, Hiromi, to Olympus Optical Co., Ltd. Heat developing device for locally heat developing a dry photosensitive film. 4,160,896, Cl. 219-216.000.

Fujita, Michio, to Toyoda-Koki Kabushiki-Kaisha. Profiling apparatus for a disk-like article having a cylindrical face and rounded corners. 4,160,438, Cl. 125-11.0TP.

Fujita, Toshio; and Teratani, Hironaga, to Nippon Kouatsu Electric Co. Low temperature calcined porcelain and process for preparation thereof. 4,160,673, Cl. 106-45.000.

Fujitsu Ten Limited: *See*—
Sato, Takeo, 4,160,955, Cl. 329-2.000.

Fukui, Seiji, to Shimano Industrial Company Limited. Multiple-speed hub for bicycles. 4,160,393, Cl. 74-750.00B.

Fukuura, Yukio: *See*—
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.

Fuller, Frank M. Fireplace utensil. 4,160,441, Cl. 126-127.000.

Furukubo, Tatsumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for purifying exhaust gas. 4,160,363, Cl. 60-290.000.

Furutani, Yoshikazu; and Kishimoto, Shinichi, to Kabushiki Kaisha Kyoto Daiichi Kagaku. Method of analyzing liquid samples and system for continuously automatically analyzing same. 4,160,646, Cl. 23-230.00R.

Futcher, Ralph J., to Dominion Engineering Works Limited. Twin wire web forming with wire tension control. 4,160,694, Cl. 162-256.000.

G.I.E. Tepral: *See*—
Moll, Manfred; Flayeux, Roland; Dicesare, Pierre; and Gross, Bernard, 4,160,787, Cl. 260-586.00D.

G. Rau: *See*—
Stockel, Dieter; and Oberg, Hans-Jurgen, 4,160,855, Cl. 428-621.000.

Ga-Vehren Engineering Company: *See*—
VerMehren, Hubert R., 4,160,500, Cl. 198-457.000.

Galicher, Georges, to Etudes et Recherches Avancees. Transmission assembly with a braking device, particularly for vehicles. 4,160,497, Cl. 192-4.00A.

Galis, Leon A.: *See*—
Daborowski, Ignace J.; and Galis, Leon A., 4,160,434, Cl. 123-140.0FG.

Galluccio, Richard A.: *See*—
Stambaugh, Robert L.; and Galluccio, Richard A., 4,160,739, Cl. 252-34.000.

Ganapathy, Ananthram: *See*—
Shenoy, Raghuram D.; and Ganapathy, Ananthram, 4,160,774, Cl. 260-424.000.

Ganz, Robert H., to Federal Paper Board Company, Inc. Bottle packaging machine. 4,160,353, Cl. 53-393.000.

Gaon, Joseph. Safety circuit to prevent the obtaining of a false count from presettable counters. 4,160,898, Cl. 235-92.0PE.

Gardner, Irwin J., to Exxon Research & Engineering Co. Method of manufacture of elastomer polyester molding compounds. 4,160,758, Cl. 260-40.00R.

Gardner, Irwin J.; and Baldwin, Francis P., to Exxon Research & Engineering Co. Elastomer modified polyester molding compound. 4,160,759, Cl. 260-40.00R.

Garner, Andrew: *See*—
Brigham, Robert J.; Sirianni, Guy V.; and Garner, Andrew, 4,160,661, Cl. 75-12.000.

Garrett Corporation, The: *See*—
Holmes, Edward S. B., 4,160,969, Cl. 338-23.000.

Gavin, David F.: *See*—
Scardera, Michael; and Gavin, David F., 4,160,776, Cl. 260-448.80R.

Gebr. Hofmann G.m.b.H. & Co., KG, Maschinenfabrik: *See*—
Himmler, Gunther, 4,160,378, Cl. 73-146.000.

Geerling, Leonardus J.: *See*—
Frye, George J.; and Geerling, Leonardus J., 4,161,029, Cl. 364-579.000.

Gelman Instrument Company: *See*—
Boomus, Mary; Sobin, Bernard; and Schweitzer, John, 4,160,700, Cl. 435-298.000.

General Electric Company: *See*—
Arendt, Ronald H.; and Curran, Matthew J., 4,160,705, Cl. 204-37.00R.
Arendt, Ronald H.; and Curran, Matthew J., 4,160,706, Cl. 204-37.00R.
Arendt, Ronald H.; and Curran, Matthew J., 4,160,708, Cl. 204-37.00R.
Born, Norman E.; and Halttunen, Martin A., 4,161,016, Cl. 361-388.000.
Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., 4,160,906, Cl. 250-322.000.
Ellicott, Harold B.; and Frank, James P., 4,160,885, Cl. 200-1.00R.
Houston, Douglas E.; Cline, Harvey E.; and Anthony, Thomas R., 4,160,679, Cl. 148-1.500.
Kindig, Alan L., 4,160,316, Cl. 29-734.000.
Roedel, George F., 4,160,858, Cl. 528-14.000.
Webb, Jimmy L.; and Corn, John E., 4,160,785, Cl. 260-583.00P.
Wilkinson, Stanley B., 4,161,011, Cl. 361-80.000.

General Instrument Corporation: *See*—
Maine, Stephen G. T., 4,160,959, Cl. 332-31.00T.

General Mills, Inc.: *See*—
Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., 4,160,850, Cl. 426-601.000.
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,820, Cl. 424-48.000.

General Motors Corporation: *See*—
Baxter, William J., 4,160,702, Cl. 204-1.00T.
Carol, John A., Jr., 4,160,900, Cl. 235-132.00E.
Vona, Nick, Jr., 4,160,367, Cl. 68-17.00R.

General Signal Corporation: *See*—
Wynn, Barry, 4,160,630, Cl. 418-102.000.

George, Benjamin B., Jr. Low energy decorative light bulb displays. 4,161,021, Cl. 362-252.000.

Geo. Cluthe Manufacturing Co. Limited, The: *See*—
Cluthe, George J., 4,160,520, Cl. 232-17.000.

Gerrity, Albert B.: *See*—
Vidal, Frederick D.; and Gerrity, Albert B., 4,160,848, Cl. 426-24.000.

Gertsch, Ulrich, to E. & U. Gertsch AG. Heel or sole holder for a sole plate of a safety ski binding and sole plate equipped with such holder. 4,160,556, Cl. 280-618.000.

Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Finsterwalder, Lorenz; Zeh, Horst; and Schaarschmidt, Ulrich, 4,160,382, Cl. 73-422.00R.

Gest, Rene: *See*—
Bichot, Bernard H.; and Gest, Rene, 4,160,398, Cl. 83-865.000.

Geyken, Erwin; and Dawidowitsch, Peter, to AGFA-Gevaert, A.G. Method and arrangement for the development of latent images particularly latent photographic images. 4,160,594, Cl. 354-324.000.

Giles, Charles L., to Polaroid Corporation. Transparent metallic coating and a glass overcoating on a plastic substrate produce a chromatic effect. 4,160,584, Cl. 351-49.000.

Gilger, William F.: *See*—
Montgomery, Murray M.; Gilger, William F.; and Steiner, William W., 4,160,617, Cl. 414-139.000.

Gillard, Richard G.: *See*—
Hounsfield, Godfrey N.; and Gillard, Richard G., 4,160,954, Cl. 328-127.000.

Gist-Brocades N.V.: *See*—
Heijboer, Robert; van Harrewijn, Antoon; and Henniger, Peter W., 4,160,829, Cl. 424-246.000.

Glass, Brian E.: *See*—
Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., 4,160,850, Cl. 426-601.000.

Global Coatings Limited: *See*—
Kaufmann, John H., 4,160,346, Cl. 52-96.000.

Gloster, Arthur: *See*—
Conroy, Edward H.; and Gloster, Arthur, 4,160,812, Cl. 423-421.000.

Goans, Kip B.: *See*—
Akkerman, Neil H.; Foster, Stephen R.; and Goans, Kip B., 4,160,463, Cl. 137-596.180.

Gobush, William: *See*—
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.

Goegelman, Robert T.: *See*—
Cole, Douglas L.; and Goegelman, Robert T., 4,160,861, Cl. 536-17.00A.

Goethals, Rafael Arsene J.: *See*—
Van Hijfte, Willy Henri P.; and Goethals, Rafael Arsene J., 4,160,782, Cl. 260-555.00C.

Goffeau, Jacques R., to United States of America, Energy. Up-and-down chopper circuit. 4,161,023, Cl. 363-124.000.

Goldberger, W. M.: *See*—
Markel, Richard F.; and Goldberger, W. M., 4,160,813, Cl. 423-448.000.

Gonsalves, Anthony W.: *See*—
Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., 4,160,857, Cl. 429-97.000.

Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for the deposition of polycrystalline silicon from the gas phase on heated carriers. 4,160,797, Cl. 264-81.000.

Gorham, Jack C., to Champion International Corporation. Paperboard bulk bin. 4,160,519, Cl. 229-37.00R.

Gottermeier, William F.: *See*—
Locey, Mark M.; and Gottermeier, William F., 4,160,799, Cl. 264-342.00R.

Gottlieb, Nathan; and Sussman, Milton H., to American Optical Corporation. Annular reflector for microscope objective. 4,160,578, Cl. 350-89.000.

Graham, Edward P.: *See*—
Fox, Charles T.; and Graham, Edward P., 4,160,442, Cl. 126-140.000.

Grahame, Robert E., Jr.: *See*—
Strunk, Richard J.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., 4,160,846, Cl. 424-288.000.

Graphite Synthesis Company: *See*—
Markel, Richard F.; and Goldberger, W. M., 4,160,813, Cl. 423-448.000.

Great Lakes Carbon Corporation: *See*—
Hardin, Edward E.; Guffey, Dean H.; and Grindstaff, Lloyd I., 4,160,814, Cl. 423-461.000.

Greenwood, Stanley W., to Rolls-Royce Limited. Method of electrolytic machining. 4,160,710, Cl. 204-129.250.

Gregg, Edmund; and Pilarczyk, Charles E., to Towmotor Corporation. Fluid filter bypass valve assembly. 4,160,735, Cl. 210-130.000.

Gregory, Peter, to Imperial Chemical Industries Limited. Water soluble cationic azo dyestuffs containing a cyclammonium group. 4,160,643, Cl. 8-26.000.

Griesbach, Melbourne L., to E.M.F., Inc. Thickness responsive blank gauge. 4,160,326, Cl. 33-174.00R.

Griesshammer, Rudolf: *See*—
Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, 4,160,797, Cl. 264-81.000.

Grindstaff, Lloyd I.: *See*—
Hardin, Edward E.; Guffey, Dean H.; and Grindstaff, Lloyd I., 4,160,814, Cl. 423-461.000.

Grodzinsky, Alan J.; and Shoenfeld, Norman A., to Massachusetts Institute of Technology. Electromechanical device. 4,161,013, Cl. 361-433.000.

Grolman, Bernard, to American Optical Corporation. Apparatus and method for making ophthalmic measurements. 4,160,330, Cl. 33-200.000.

Gromlich, Roy J.; Brech, Kilian H., deceased (by Brech, Avis, executrix); and Cist, John D., to Du Pont de Nemours, E. I., and Company; and Sonic Instruments, Inc. Pipe quality monitoring mechanism. 4,160,385, Cl. 73-622.000.

Groot, Theodorus C.; Huijer, Pieter; and van Lent, Johannes G., to U.S. Philips Corporation. Method and apparatus for providing reference points for mounting the magnetic deflection unit of a color display tube. 4,160,935, Cl. 315-370.000.

Gross, Bernard: *See—*
Moll, Manfred; Flayeux, Roland; Dicesare, Pierre; and Gross, Bernard, 4,160,787, Cl. 260-586.00D.

GTE Sylvania Incorporated: *See—*
Bojanek, Robert J.; and Mason, Marvin S., 4,160,876, Cl. 179-15.0AT.
Monroe, Tex K., 4,160,936, Cl. 315-388.000.

Guenther, Lloyd M.: *See—*
Soutar, David, Jr.; Feffer, Philip C.; and Guenther, Lloyd M., 4,160,307, Cl. 28-220.000.

Guequierre, Denis D.: *See—*
Berger, L. Joseph, Jr.; and Guequierre, Denis D., 4,160,684, Cl. 156-69.000.

Guffey, Dean H.: *See—*
Hardin, Edward E.; Guffey, Dean H.; and Grindstaff, Lloyd I., 4,160,814, Cl. 423-461.000.

Gulf Oil Corporation: *See—*
Kirkpatrick, Joel L., 4,160,839, Cl. 424-269.000.

Gunning, William F.: *See—*
Damouth, David E.; and Gunning, William F., 4,160,939, Cl. 318-723.000.

Gurkov, Konstantin S.: *See—*
Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V., 4,160,486, Cl. 173-135.000.

Guter, Gerald A. Water purification device and system. 4,160,738, Cl. 210-232.000.

Gutowski, Gerald E.: *See—*
Miller, Jean C.; and Gutowski, Gerald E., 4,160,767, Cl. 260-244.400.

Guyot, Volker; Maus, Otfrid; and Muller, Martin, to Carl Schenck AG. Process for the turning-in of a part to be balanced affected by imbalance. 4,160,384, Cl. 73-462.000.

Haas, Steven L.: *See—*
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.

Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu. Argon laser flash exposure of spectrally sensitized silver halide photographic material. 4,160,669, Cl. 96-27.00E.

Hacias, Kenneth J., to Oxy Metal Industries Corporation. Water emulsifiable lubricant and coolant. 4,160,370, Cl. 72-42.000.

Hackbarth, Richard W.; Puariea, Douglas A.; and Kramlinger, Philip J., to Maxson Corporation, The. Articulated schnabel Car. 4,160,420, Cl. 105-367.000.

Hagan, Ernest P., Jr.: *See—*
Martin, Robert E.; and Hagan, Ernest P., Jr., 4,160,652, Cl. 55-46.000.

Hager, Charles C.: *See—*
Long, Warner D.; Hager, Charles C.; and Hempenstall, George T., 4,160,806, Cl. 422-223.000.

Hager, Lowell P.: *See—*
White, Robert H.; and Hager, Lowell P., 4,160,802, Cl. 422-68.000.

Haggstrom, Sten L.: *See—*
Lindahl, Jonas A. I.; Tiberg, Ernst B.; and Haggstrom, Sten L., 4,160,693, Cl. 162-24.000.

Hairegenics, Inc.: *See—*
Miller, Paul W., 4,160,453, Cl. 128-330.000.

Halliburton Company: *See—*
Cole, Clinton W., 4,160,627, Cl. 417-403.000.

Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., to General Mills, Inc. Shelf-stable mix for a spreadable butter-substitute. 4,160,850, Cl. 426-601.000.

Halm, James M., to AM International, Inc. Aluminum chelates as acceptor type sensitizers and plasticizers for photoconductive polymers. 4,160,667, Cl. 96-1.50R.

Halttunen, Martin A.: *See—*
Born, Norman E.; and Halttunen, Martin A., 4,161,016, Cl. 361-388.000.

Hamana, Junji: *See—*
Kato, Hiroaki; and Hamana, Junji, 4,161,005, Cl. 360-129.000.

Hamilton, Ralph A. Omnidirectional heat pipe. 4,160,444, Cl. 126-271.000.

Hamster, Helmut: *See—*
Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, 4,160,797, Cl. 264-81.000.

Hans, Andre: *See—*
Josis, Christian; and Hans, Andre, 4,160,725, Cl. 210-21.000.

Haraguchi, Tamotsu, to TEAC Corporation. Magnetic tape cassette apparatus. 4,161,007, Cl. 360-137.000.

Hardin, Edward E.; Guffey, Dean H.; and Grindstaff, Lloyd I., to Great Lakes Carbon Corporation. Thermal desulfurization and calcination of petroleum coke. 4,160,814, Cl. 423-461.000.

Harken, Peter O.; and Lawson, William E., to Vanguard, Inc. Swivel base. 4,160,541, Cl. 254-192.000.

Harnischfeger Corporation: *See—*
Fritsch, Robert A., 4,160,558, Cl. 280-797.000.

Harper, David J.: *See—*
Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,866, Cl. 560-25.000.

Harris Corporation: *See—*
Raney, Meredith T., Jr., 4,160,981, Cl. 340-721.000.

Harris, Robert M., Jr., to Foremost-McKesson, Inc. Method and apparatus utilizing staged reverse osmosis units for purifying and dispensing water. 4,160,727, Cl. 210-23.00H.

Harvey, Francis J., II: *See—*
Fey, Maurice G.; and Harvey, Francis J., II, 4,160,867, Cl. 13-2.00P.

Harvey, Robin J.; and Lutz, Michael A., to Hughes Aircraft Company. Automatic crowbar and arc quenching system. 4,161,009, Cl. 361-56.000.

Hasenpath, Helmut; and Rohde, Hargen. Mechanical sweepers. 4,160,303, Cl. 15-349.000.

Hashimoto, Shigeru; and Inoue, Kenji, to Sunstar Hamigaki Kabushiki Kaisha. Dentifrices. 4,160,822, Cl. 424-52.000.

Hauber, Peter F. Sliding door lock assembly. 4,160,560, Cl. 292-101.000.

Haupt, Joachim: *See—*
Chard, Gerald L. P.; Haupt, Joachim; and Zuber, Werner, 4,160,890, Cl. 200-308.000.

Hawkins, Robert W.; Togami, Paul G.; and Drayer, T. Gary, to International Harvester Company. 2-Speed rotor gear case. 4,160,456, Cl. 130-27.00T.

Hayashi, Kohji: *See—*
Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.

Hays, Ronald M., Jr., to Texas Instruments Incorporated. Plural supply path acoustic surface wave device. 4,160,963, Cl. 333-151.000.

Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., to Janssen Pharmaceutica, N.V. Heterocyclic derivatives of 1-(1,3-dioxolan-2-ylmethyl)-1H-imidazoles. 4,160,841, Cl. 424-273.00R.

Heeres, Jan: *See—*
Van Reet, Gustaaf; Heeres, Jan; and Wals, Lourens, 4,160,838, Cl. 424-269.000.

Heijboer, Robert; van Harrewijn, Antoon; and Henniger, Peter W., to Gist-Brocades N.V. Antibacterial 1,2,4-oxadiazolylacetamido cephalosporins. 4,160,829, Cl. 424-246.000.

Heil, Oskar. Acoustic transducer and method of making same. 4,160,883, Cl. 179-114.00M.

Heinen, Hans D., to Intellectual Trade Cy S.A. Fire door assembly. 4,160,421, Cl. 110-173.00R.

Heiniger, Wilfred; Kreienbuehl, Claude; and Millan, Manuel, to Bolex International S.A. Camera equipped with range finder for manual or automatic focusing. 4,160,587, Cl. 354-25.000.

Helle, Kees; and Kamp, Andries, to Akzo N.V. Process for applying coatings containing both a metal and a synthetic resin. 4,160,707, Cl. 204-37.00R.

Heller, Macy E.: *See—*
Firester, Arthur H.; and Heller, Macy E., 4,160,598, Cl. 356-121.000.

Hempenstall, George T.: *See—*
Long, Warner D.; Hager, Charles C.; and Hempenstall, George T., 4,160,806, Cl. 422-223.000.

Henkel Corporation: *See—*
Virnig, Michael J.; and MacKay, Kenneth D., 4,160,807, Cl. 423-24.000.

Henniger, Peter W.: *See—*
Heijboer, Robert; van Harrewijn, Antoon; and Henniger, Peter W., 4,160,829, Cl. 424-246.000.

Henry Balfour & Company Limited: *See—*
Mitchell, James; and Pye, Thomas N., 4,160,692, Cl. 159-6.00W.

Herculite Protective Fabrics Corporation: *See—*
Von Kohorn, Henry; and Kydonieus, Agis F., 4,160,335, Cl. 43-131.000.

Hermann Berstorff Maschinebau GmbH: *See—*
Kolossow, Klaus-Dieter, 4,160,638, Cl. 425-302.100.

Herrmann, Hans: *See—*
Kudlich, Walter; Herrmann, Hans; Lechner, Gunther; and Berger, Kurt, 4,160,504, Cl. 206-334.000.

Hewlett-Packard Company: *See—*
Kamins, Theodore I.; and Fong, Godfrey T., 4,160,985, Cl. 357-30.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.
Pierce, Perry H.; and Prendergast, Dan L., 4,161,017, Cl. 361-412.000.

Hidden, William P.; and McCullough, John E., to Arthur D. Little, Inc. Liquid immersible scroll pump. 4,160,629, Cl. 418-55.000.

Higashitsuji, Ken: *See—*
Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yugi, 4,160,711, Cl. 204-152.000.

Higgins, Larry, to Leggett & Platt, Incorporated. Small diameter, single cone coil spring for use in a box spring assembly. 4,160,544, Cl. 267-166.000.

Higley, David P., to Union Carbide Corporation. Oxidation of ketones to esters. 4,160,769, Cl. 260-343.000.

Higley, Willard S.; Cantor, Paul A.; and Fisher, Bruce S., to United States of America, Health, Education and Welfare. Polycarbonate membranes and production thereof. 4,160,791, Cl. 525-469.000.

Hilbern, Tom, to Melcher Manufacturing Co., Inc. Unitary seat for inner tube float. 4,160,299, Cl. 9-347.000.

Hildon, Anthony M.; Manly, Thomas D.; and Jaggers, Alan J., to Propylox a Society Anonyme. Epoxidation. 4,160,778, Cl. 260-502.00R.

Himmler, Gunther, to Gebr. Hofmann G.m.b.H. & Co., KG, Maschinenfabrik. Tire testing machine. 4,160,378, Cl. 73-146.000.

Hirasawa, Kunio: *See—*
Natsui, Ken-ichi; Hirasawa, Kunio; Yoshioka, Yoshio; and Chida, Hiroshi, 4,160,888, Cl. 200-148.00A.
Hirose, Masateru: *See—*
Tanno, Shogo; and Hirose, Masateru, 4,160,947, Cl. 324-54.000.
Hirschmann, Peter; and Hoefer, Ernst, to Siemens Aktiengesellschaft. Conference circuit with digital-analog and analog-digital conversion. 4,160,878, Cl. 179-18.0BC.
Hirst, Peter B.; and Duthie, Anthony J., to Johnston Brothers (Engineering) Limited. Refuse collecting vehicles. 4,160,302, Cl. 15-340.000.
Hitachi, Ltd.: *See—*
Matsuura, Shigeo; Nagashima, Toshio; and Shinagawa, Mitsuhisa, 4,160,953, Cl. 325-440.000.
Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, 4,160,713, Cl. 204-180.00P.
Mikoshiba, Shigeo; and Shinada, Shinichi, 4,160,932, Cl. 315-169.400.
Natsui, Ken-ichi; Hirasawa, Kunio; Yoshioka, Yoshio; and Chida, Hiroshi, 4,160,888, Cl. 200-148.00A.
Satoh, Takashi, 4,161,040, Cl. 365-203.000.
Hitachi Plant Engineering and Construction Co., Ltd.: *See—*
Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, 4,160,713, Cl. 204-180.00P.
Hitachi Shipbuilding & Engineering Co. Ltd.: *See—*
Inaba, Hideya; Tatsumi, Toshio; and Iwai, Chihiro, 4,160,805, Cl. 422-180.000.
Hoechst Aktiengesellschaft: *See—*
Mischke, Peter; Fleckenstein, Erwin; and Mohr, Reinhard, 4,160,764, Cl. 260-206.000.
Soder, Alfons; and Perrey, Klaus, 4,160,828, Cl. 424-200.000.
Stahlhofen, Paul, 4,160,671, Cl. 96-91.00D.
Hoefer, Ernst: *See—*
Hirschmann, Peter; and Hoefer, Ernst, 4,160,878, Cl. 179-18.0BC.
Hoffmann-La Roche Inc.: *See—*
Chan, Ka-Kong; and Saucy, Gabriel, 4,160,865, Cl. 560-22.000.
Hogan, William J., to Spectrum X-ray Corporation. Automatic chest X-ray machine. 4,160,912, Cl. 250-468.000.
Hogg, Alexander F.: *See—*
Bory, Richard A.; and Hogg, Alexander F., 4,160,961, Cl. 333-27.000.
Holbrook, Arthur J., to Rolf C. Hagen (USA) Corp. Aquarium waterfall. 4,160,427, Cl. 119-5.000.
Holcroft & Company: *See—*
Miskolczy, Gabor; Nowak, Leonard G.; and Shefsiek, Paul K., 4,160,641, Cl. 432-59.000.
Hollybank Engineering Company Limited: *See—*
Jackson, David B.; and Sisson, Keith T., 4,160,609, Cl. 403-407.000.
Holmes, Edward S. B., to Garrett Corporation, The. Transducer and method of making. 4,160,969, Cl. 338-23.000.
Holtey, Thomas O.: *See—*
Joyce, Thomas F.; and Holtey, Thomas O., 4,161,024, Cl. 364-200.000.
Holtrop, John W.: *See—*
Ayler, Steven E.; and Holtrop, John W., 4,160,405, Cl. 89-7.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Matsumoto, Katsuhiko, 4,160,565, Cl. 297-483.000.
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,160,431, Cl. 123-75.00B.
Honda, Koichi: *See—*
Miyairi, Sachio; Tanaka, Hideaki; Yabe, Akira; and Honda, Koichi, 4,160,698, Cl. 435-173.000.
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, to Bridgestone Tire Co., Ltd. Adhesive composition. 4,160,757, Cl. 260-31.20N.
Honeywell Inc.: *See—*
Wilwerding, Dennis J., 4,160,904, Cl. 250-201.000.
Honeywell Information Systems Inc.: *See—*
Joyce, Thomas F.; and Holtey, Thomas O., 4,161,024, Cl. 364-200.000.
Wilhite, John E., 4,161,026, Cl. 364-200.000.
Honeywell Information Systems Italia: *See—*
Caenazzo, Santo, 4,160,606, Cl. 400-616.200.
Honnen, Lewis R.: *See—*
Lewis, Robert A.; and Honnen, Lewis R., 4,160,648, Cl. 44-63.000.
HOP Corporation, The: *See—*
Turk, L. Jan; and Kehle, Ralph O., 4,160,481, Cl. 166-272.000.
Hopper, Troy K. Welding machine for valve housings. 4,160,895, Cl. 219-125.100.
Hopta, Daniel F.; and Beelitz, Howard R., to RCA Corporation. Switched current regulator. 4,160,943, Cl. 323-4.000.
Hopwood, Francis W.: *See—*
Mims, James H.; and Hopwood, Francis W., 4,160,958, Cl. 331-178.000.
Horiike, Yasuhiro: *See—*
Shibagaki, Masahiro; Horiike, Yasuhiro; and Yamazaki, Takashi, 4,160,690, Cl. 156-643.000.
Houldsworth, John A., to U.S. Philips Corporation. Current measuring apparatus. 4,160,950, Cl. 324-107.000.
Hounsfield, Godfrey N., to E M I Limited. Fan beam CT apparatus the interbeam angle of which varies with position across the fan. 4,160,911, Cl. 250-445.00T.
Hounsfield, Godfrey N.; and Gillard, Richard G., to E M I Limited. Multiple rate discharge circuit for integrator, especially for use in computerized axial tomography. 4,160,954, Cl. 328-127.000.
Houston, Douglas E.; Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Migration of fine liquid wires by thermal gradient zone melting through doped surfaces. 4,160,679, Cl. 148-1.500.
Howe, James D.: *See—*
Dey, Thomas W.; Howe, James D.; and Letter, Eugene C., 4,161,014, Cl. 362-263.000.
Howmet Turbine Components Corporation: *See—*
Lirones, Nick G., 4,160,796, Cl. 264-60.000.
Hsieh, Jack. Method for the direct reduction of iron ore. 4,160,663, Cl. 75-35.000.
Hsu, Charles J. Emergency water leak plug. 4,160,465, Cl. 138-97.000.
Huang, John C. P.: *See—*
Chapman, Harvey A.; Fowler, John S.; Huang, John C. P.; and Leslie, James B., 4,160,348, Cl. 52-202.000.
Huang, Te-Hsiu. Automatic dumpling making machine. 4,160,634, Cl. 425-112.000.
Hubbard, Junius P. Window shutter and mounting therefor. 4,160,343, Cl. 49-90.000.
Hubbard, Winchester L.: *See—*
Strunk, Richard J.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., 4,160,846, Cl. 424-288.000.
Hubert, Maurice: *See—*
Dahy, Jean-Jacques; and Hubert, Maurice, 4,161,025, Cl. 364-200.000.
Huchette, Michel; and Bussiere, Guy, to Roquette Freres. Foods containing potato pulp. 4,160,849, Cl. 426-94.000.
Huckabay, Durward A., to Imperial West Chemical Company. Aluminum sulfate manufacturing process. 4,160,815, Cl. 423-556.000.
Huff, Joel R.: *See—*
Saari, Walfred S.; and Huff, Joel R., 4,160,712, Cl. 204-158.00R.
Hughes Aircraft Company: *See—*
Harvey, Robin J.; and Lutz, Michael A., 4,161,009, Cl. 361-56.000.
Ladd, Glenn O., Jr.; and Cleary, Frederick W., 4,160,984, Cl. 357-22.000.
Hughes Tool Company: *See—*
Dill, Herbert C.; and Wisler, Allen E., 4,160,543, Cl. 266-252.000.
Huijer, Pieter: *See—*
Groot, Theodorus C.; Huijer, Pieter; and van Lent, Johannes G., 4,160,935, Cl. 315-370.000.
Hukuta, Masakazu; and Kobayashi, Hirotsugi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Device for capping supplying opening of fuel-tank. 4,160,511, Cl. 220-210.000.
Humphreys, Kenneth R.: *See—*
Tognazzini, Jere W.; and Humphreys, Kenneth R., 4,160,889, Cl. 200-163.000.
Hunter Douglas International N.V.: *See—*
Brugman, Johannes A. H., 4,160,344, Cl. 52-39.000.
Hutzenlaub, Armin S. P.; and Pack, Klaus. Roller winding machine for the formation of single reels. 4,160,529, Cl. 242-56.600.
Hveding, Arne, to Lade Metall A/S. Systems for launching or hauling up small boats. 4,160,611, Cl. 405-2.000.
Ichiyanagi, Yutaka, to Sony Corporation. Device for holding a rotatable record disc. 4,161,003, Cl. 360-99.000.
Iguchi, Shigeru: *See—*
Tsubai, Yasuo; Iguchi, Shigeru; Suzuki, Shigeyoshi; and Iwata, Tamotsu, 4,160,670, Cl. 96-119.00R.
Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, to Sumitomo Electric Industries, Ltd. Method and apparatus for detecting internal cavities in casting bars. 4,160,387, Cl. 73-639.000.
Iida, Kazuyoshi: *See—*
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
Iijima, Eiji: *See—*
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,160,823, Cl. 424-70.000.
Ikeda, Yosaku. Apparatus for producing wooden heads of golf clubs. 4,160,635, Cl. 425-128.000.
IMC Magnetics Corp.: *See—*
Smith, Gordon S.; and Comstock, Theodore R., 4,160,304, Cl. 16-49.000.
Imperial Chemical Industries Limited: *See—*
Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,866, Cl. 560-25.000.
Gregory, Peter, 4,160,643, Cl. 8-26.000.
Ridgeway, John J., 4,160,413, Cl. 102-24.0HC.
Imperial West Chemical Company: *See—*
Huckabay, Durward A., 4,160,815, Cl. 423-556.000.
Inaba, Hideya; Tatsumi, Toshio; and Iwai, Chihiro, to Hitachi Shipbuilding & Engineering Co. Ltd. Boiler containing denitrator. 4,160,805, Cl. 422-180.000.
Inagaki, Tetsuhiko; and Maeda, Keisuke, to Minolta Camera Kabushiki Kaisha. Electromagnetic release mechanism for photographic cameras. 4,160,983, Cl. 354-234.000.
Inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyanishi, Toshiaki, to Ajinomoto Co., Inc. Insect attractive compositions. 4,160,824, Cl. 424-84.000.
Incotex S.A.: *See—*
Camprubi, Anselmo B., 4,160,468, Cl. 139-453.000.
Indelicato, Alphonse. Signal tube. 4,160,333, Cl. 40-322.000.
Inductotherm Corp.: *See—*
Kennedy, Theodore R., 4,160,966, Cl. 336-155.000.
Ingle, James E.: *See—*
McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,160,566, Cl. 299-30.000.

Inoue, Kenji: *See*—
Hashimoto, Shigeru; and Inoue, Kenji, 4,160,822, Cl. 424-52.000.
Inoue, Yoshihiro: *See*—
Nagasaki, Katsumi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; Yano, Akifumi; and Momose, Tetsuo, 4,160,662, Cl. 75-24.000.
Instron Corporation: *See*—
DeNicola, Joseph P., 4,160,325, Cl. 33-148.00D.
Intellectual Trade Cy S.A.: *See*—
Heinen, Hans D., 4,160,421, Cl. 110-173.00R.
Interbrev S.A.: *See*—
Pizzoccaro, Luigi, 4,160,306, Cl. 24-205.00R.
International Business Machines Corporation: *See*—
Abolafia, Oscar R.; and Rasile, John, 4,160,691, Cl. 156-664.000.
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,160,991, Cl. 357-49.000.
Dennard, Robert H.; and Rideout, Vincent L., 4,160,987, Cl. 357-41.000.
Meyen, Robert H.; Puttlitz, Karl J.; Schink, Karl; and Wenskus, Herbert, 4,160,893, Cl. 219-85.0BA.
International Harvester Company: *See*—
Bexten, Eugen; Logue, Robert W.; and Wiebe, Ken J., 4,160,490, Cl. 180-133.000.
Hawkins, Robert W.; Togami, Paul G.; and Drayer, T. Gary, 4,160,456, Cl. 130-27.00T.
International Nickel Company, Inc., The: *See*—
Baldwin, Stanley L., 4,160,615, Cl. 405-259.000.
International Paper Company: *See*—
Nowacki, Ulrich G., 4,160,406, Cl. 93-36.300.
Iog Industrie-Ofenbau GmbH: *See*—
Wilkening, Hermann; and Loges, Hans-Joachim, 4,160,371, Cl. 72-147.000.
Ishikawa, Fujio, to Toyo Denki Seizo Kabushiki Kaisha. Quadruple frequency converter. 4,160,925, Cl. 310-160.000.
Ishikawa, Fumio; and Tsuda, Yukio, to Sony Corporation. High frequency wide band resonant circuit. 4,160,964, Cl. 334-15.000.
Ishikawa, Hikaru: *See*—
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
Ishimaru, Wataru: *See*—
Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, 4,160,392, Cl. 74-732.000.
Israel Electro-Optical Industry Ltd.: *See*—
Toor, Yair; Rouso, Haim; and Kopilavitz, Ben-Zion, 4,161,035, Cl. 364-900.000.
Itek Corporation: *See*—
Ebner, Peter R., 4,160,586, Cl. 354-5.000.
Ito, Hiromi: *See*—
Fujimori, Ryo; and Ito, Hiromi, 4,160,896, Cl. 219-216.000.
Ito, Kenzo; and Abe, Yoshiharu, to Copyer Co., Ltd. Copying machine equipped with a flash type fixing apparatus. 4,160,595, Cl. 355-3.0FU.
Ivakhnenko, Viktor V.: *See*—
Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N., 4,160,640, Cl. 431-9.000.
Iwai, Chihiro: *See*—
Inaba, Hideya; Tatsumi, Toshio; and Iwai, Chihiro, 4,160,805, Cl. 422-180.000.
Iwata, Tamotsu: *See*—
Tsubai, Yasuo; Iguchi, Shigeru; Suzuki, Shigeyoshi; and Iwata, Tamotsu, 4,160,670, Cl. 96-119.00R.
Jac. Jacobsen A/S: *See*—
Krogsrud, Jens C., 4,160,536, Cl. 248-280.100.
Jackman, Anthony D., to Bettix Limited. Floats and method for making same. 4,160,381, Cl. 73-322.500.
Jackson, David B.; and Sisson, Keith T., to Hollybank Engineering Company Limited. Connector for bolted joints. 4,160,609, Cl. 403-407.000.
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., to Southwest Research Institute. Ultrasonic inspection system including apparatus and method for tracking and recording the location of an inspection probe. 4,160,386, Cl. 73-625.000.
Jackson, Richard R. Blood pressure measuring catheter. 4,160,448, Cl. 128-673.000.
Jacobs, Jacqueline M.: *See*—
United States of America, National Aeronautics and Space Administration; and Jacobs, Jacqueline M., 4,160,601, Cl. 356-404.000.
Jaggers, Alan J.: *See*—
Hildon, Anthony M.; Manly, Thomas D.; and Jaggers, Alan J., 4,160,778, Cl. 260-502.00R.
Jain, Faquir C.; and Melehy, Mahmoud A. Heterojunction solar cell. 4,160,678, Cl. 136-89.0SJ.
James, Rex L.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.
Janssen Pharmaceutica, N.V.: *See*—
Heeres, Jan; Backx, Leo J. J.; and Mostmans, Joseph H., 4,160,841, Cl. 424-273.00R.
Vandenberk, Jan; Kennis, Ludo E. J.; Van Der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,160,836, Cl. 424-267.000.
Van Reet, Gustaaf; Heeres, Jan; and Wals, Lourens, 4,160,838, Cl. 424-269.000.
Jaworski, Eugene: *See*—
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,160,548, Cl. 273-1.00M.
Jayakar, Kirshnakumar M.: *See*—
Seader, Junior D.; and Jayakar, Kirshnakumar M., 4,160,720, Cl. 208-11.00R.
Jennmar Corporation: *See*—
Koval, Stephen F., 4,160,614, Cl. 405-259.000.
Jensen, Brian J., to NFE International, Ltd. Sand core cleaning apparatus with double roller delivery of cleaning material. 4,160,650, Cl. 51-16.000.
Jensen, Erik A. Bias setting apparatus for use with television receivers. 4,160,995, Cl. 358-29.000.
Jepson, John W.: *See*—
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.
Jesinger, David W., to Plessey Handel und Investments AG. Signal re-generation apparatus. 4,160,957, Cl. 331-107.00A.
Joannic, Jean V., to Botalam. Twisting device for a machine for binding packages with wire. 4,160,469, Cl. 140-115.000.
Johannsen, Thorkil J. Side-fold conveyor. 4,160,501, Cl. 198-632.000.
Johns-Manville Corporation: *See*—
Brooks, Ray G.; and Smith, Harvell M., 4,160,688, Cl. 156-574.000.
Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Combined solenoid and timing system for SLR camera apparatus. 4,160,589, Cl. 354-86.000.
Johnson, David M. Bipolar transistors having fixed gain characteristics. 4,160,986, Cl. 357-36.000.
Johnson, Harold R. Hand operated jack for a multipurpose jig apparatus of the type including a length of pipe and a plurality of releasable, pipe-gripping tail stops. 4,160,539, Cl. 254-106.000.
Johnson & Johnson: *See*—
Sipos, Tibor, 4,160,821, Cl. 424-49.000.
Johnston Brothers (Engineering) Limited: *See*—
Hirst, Peter B.; and Duthie, Anthony J., 4,160,302, Cl. 15-340.000.
Johnston, Roger L., to Simon-Krause, Inc. Control system for mobile self-propelled aerial lift. 4,160,492, Cl. 182-2.000.
Jolly, William D.: *See*—
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.
Jones, Barry E.; and Smith, John A., to National Research Development Corporation. Transponders. 4,160,971, Cl. 340-152.00T.
Jordan, Theodore M., to Westinghouse Electric Corp. Apparatus for treating a spinneret plate to be reused into the manufacture of synthetic fibers. 4,160,637, Cl. 425-225.000.
Josef Wagner GmbH, Firma: *See*—
Wagner, Josef, 4,160,525, Cl. 239-332.000.
Joseph, Robert E., to United States of America, Commerce. Document reproduction illumination/exposure control system. 4,160,596, Cl. 355-68.000.
Josis, Christian; and Hans, Andre, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie; and Siderurgiemaritime-Maritime Staalnijverheid. Waste water purification processes. 4,160,725, Cl. 210-21.000.
Joslyn Mfg. and Supply Co.: *See*—
Cunningham, Francis V., 4,161,012, Cl. 361-128.000.
Journey, William K., to Preussag Aktiengesellschaft. Deep well pump. 4,160,623, Cl. 417-238.000.
Jousson, Pierre J., to Les Produits Associates LPA SA. Flexible multiconduit tube and its manufacture. 4,160,466, Cl. 138-115.000.
Joyce, Thomas F.; and Holtey, Thomas O., to Honeywell Information Systems Inc. Private cache-to-CPU interface in a bus oriented data processing system. 4,161,024, Cl. 364-200.000.
Junkermann, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for deodorizing liquid manure and removing harmful gases. 4,160,656, Cl. 71-21.000.
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Artbauer, Jan, 4,160,870, Cl. 174-14.00R.
Lambelet, Percy, 4,160,426, Cl. 118-323.000.
Kabushiki Kaisha Kyoto Daiichi Kagaku: *See*—
Furutani, Yoshikazu; and Kishimoto, Shinichi, 4,160,646, Cl. 23-230.00R.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Hukuta, Masakazu; and Kobayashi, Hirotsugi, 4,160,511, Cl. 220-210.000.
Kahn, Leonard R. Security system. 4,160,875, Cl. 179-1.50M.
Kaiser Aluminum & Chemical Corporation: *See*—
Andersen, John N.; and Bell, Norman, 4,160,809, Cl. 423-119.000.
Kakie, Yoshiaki: *See*—
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibatani, Takeji; and Nishimura, Noriyuki, 4,160,697, Cl. 435-194.000.
Kakimoto, Toshio: *See*—
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibatani, Takeji; and Nishimura, Noriyuki, 4,160,697, Cl. 435-194.000.
Kallberg, Tommy K.; and Rangert, Bo, to Aktiebolaget Partner. Portable gas-motor-driven cutting implement. 4,160,321, Cl. 30-383.000.
Kamin, Gerhard, to Robert Bosch GmbH. Television-based alarm system. 4,160,998, Cl. 358-105.000.
Kamins, Theodore I.; and Fong, Godfrey T., to Hewlett-Packard Company. Photosensing arrays with improved spatial resolution. 4,160,985, Cl. 357-30.000.
Kamp, Andries: *See*—
Helle, Kees; and Kamp, Andries, 4,160,707, Cl. 204-37.00R.

Kanazawa, Kenichi; and Takahashi, Nobuyuki, to Sony Corporation. Controllable rectifier circuit for a power supply. 4,161,022, Cl. 363-88.000.
Kane, Jeffrey, to Ferranti Limited. Semiconductor devices and circuit arrangements including such devices. 4,160,990, Cl. 357-48.000.
Kao Soap Co., Ltd.: *See*—
Watanabe, Hiroshi; Shirose, Toshihiro; and Iijima, Eiji, 4,160,823, Cl. 424-70.000.
Karikh, Nikolai B.: *See*—
Pechuk, Vasily I.; Pompeev, Vladimir M.; and Karikh, Nikolai B., 4,160,377, Cl. 73-141.00A.
Kato, Hiroaki; and Hamana, Junji, to Canon Kabushiki Kaisha. Magnetic heads and fixing material with an additional filler of MoS_2. 4,161,005, Cl. 360-129.000.
Kaufmann, John H., to Global Coatings Limited. Roof coating composition and construction. 4,160,346, Cl. 52-96.000.
Kaul, Martin: *See*—
Opprecht, Paul; and Kaul, Martin, 4,160,892, Cl. 219-83.000.
Kawai, Hisasi: *See*—
Morino, Seiji; and Kawai, Hisasi, 4,160,429, Cl. 123-32.0EB.
Kawai Musical Instrument Mfg. Co. Ltd.: *See*—
Deutsch, Ralph, 4,160,399, Cl. 84-1.030.
Kehle, Ralph O.: *See*—
Turk, L. Jan; and Kehle, Ralph O., 4,160,481, Cl. 166-272.000.
Keillor, Warren. Special effects device. 4,160,585, Cl. 352-87.000.
Keller, Cecil T.: *See*—
Britton, Fred G.; Von Bose, Robert J.; and Keller, Cecil T., 4,160,612, Cl. 405-227.000.
Kelley, Carl S., to Phillips Petroleum Company. Controlling a regeneration of fluidized particles or catalysts. 4,160,743, Cl. 252-411.00R.
Kelly, Ralph: *See*—
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,160,819, Cl. 424-45.000.
Kemp, Willard E., to ACF Industries, Incorporated. Fire-safe valve structure. 4,160,460, Cl. 137-72.000.
Kennedy, Theodore R., to Inductotherm Corp. Stabilized reactor. 4,160,966, Cl. 336-155.000.
Kennis, Ludo E. J.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van Der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,160,836, Cl. 424-267.000.
Keogh, Raymond W.: *See*—
Orr, Thomas S. C.; and Keogh, Raymond W., 4,160,844, Cl. 424-283.000.
Kerr-McGee Corporation: *See*—
McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,160,566, Cl. 299-30.000.
Keur, Robert I., to A. B. Dick Company. Anti-dispersion accumulator for ink jet printing system. 4,160,982, Cl. 346-75.000.
Kievsky Institut Avtomatiki Imeni XXV Siezda KPSS: *See*—
Pechuk, Vasily I.; Pompeev, Vladimir M.; and Karikh, Nikolai B., 4,160,377, Cl. 73-141.00A.
Killerwatt Corporation: *See*—
Miller, Jack V., 4,161,020, Cl. 362-216.000.
Kindig, Alan L., to General Electric Company. Apparatus for positioning insulating members in magnetic core slots. 4,160,316, Cl. 29-734.000.
King, Robert V.: *See*—
Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., 4,160,906, Cl. 250-322.000.
Kingsbury, Paul I., Jr.; and Seward, Thomas P., III, to Corning Glass Works. Process for making gradient photochromic glass articles. 4,160,655, Cl. 65-30.00R.
Kinning, Robert F.: *See*—
Newell, Robert C.; and Kinning, Robert F., 4,160,424, Cl. 112-275.000.
Kinosz, Donald L.; and Allen, William R., to Aluminum Company of America. Electrolytic furnace lining. 4,160,715, Cl. 204-243.00R.
Kirchmayr, Rudolf: *See*—
Schmidt, Andreas; and Kirchmayr, Rudolf, 4,160,794, Cl. 260-927.00R.
Kirkland, Joseph J.; and Yau, Wallace W., to Du Pont de Nemours, E. I., and Company. Bimodal chromatographic resolving zone. 4,160,728, Cl. 210-31.00C.
Kirkpatrick, Joel L., to Gulf Oil Corporation. Carbamyltriazole insecticides. 4,160,839, Cl. 424-269.000.
Kirsch, Howard C., to Bell Telephone Laboratories, Incorporated. Current control circuit for light emitting diode. 4,160,934, Cl. 315-307.000.
Kiser, Dennis D.: *See*—
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,160,443, Cl. 126-270.000.
Kishimoto, Shinichi: *See*—
Furutani, Yoshikazu; and Kishimoto, Shinichi, 4,160,646, Cl. 23-230.00R.
Kleimann, Helmut: *See*—
Lienert, Hans-Jurgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.
Klimashko, Vladimir V.: *See*—
Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V., 4,160,486, Cl. 173-135.000.
Knauer, Kuno: *See*—
Tuscher, Otto; Butter, Karl; and Knauer, Kuno, 4,160,709, Cl. 204-49.000.
Knight, Kenneth R. Foldable hand baggage. 4,160,496, Cl. 190-43.000.
Knupp, Dwight A., to Chrysler Corporation. Composite fluid flowmeter with slotted arcuate axial exhaust. 4,160,379, Cl. 73-229.000.
Kobayashi, Hirotsugi: *See*—
Hukuta, Masakazu; and Kobayashi, Hirotsugi, 4,160,511, Cl. 220-210.000.
Kobayashi, Yoshio: *See*—
Maruhashi, Shigeaki; and Kobayashi, Yoshio, 4,160,664, Cl. 75-49.000.
Kobler, Ulrich; and Tamm, Horst, to Siemens Aktiengesellschaft. Polarized miniature relay. 4,160,965, Cl. 335-79.000.
Kochs Adler AG: *See*—
Scholl, Hans; and Tiemann, Helmut, 4,160,423, Cl. 112-121.120.
Kogure, Hiroshi: *See*—
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,160,431, Cl. 123-75.00B.
Kokin, Vilyam N.: *See*—
Nazarian, Artashes R.; Kremlev, Vyacheslav Y.; Kokin, Vilyam N.; and Manzha, Nikolai M., 4,160,918, Cl. 307-205.000.
Kolossow, Klaus-Dieter, to Hermann Berstorff Maschinebau GmbH. Apparatus for forming sheets of foamed synthetic plastics material. 4,160,638, Cl. 425-302.100.
Kondo, Kazuo: *See*—
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
Kondo, Yoshikazu: *See*—
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
Koo, Ronald: *See*—
Thorington, Luke; Walsh, Peter; Koo, Ronald; and Thouret, Wolfgang, 4,160,929, Cl. 313-112.000.
Kopecki, Ronald: *See*—
Beseke, Kermit; and Kopecki, Ronald, 4,160,873, Cl. 178-58.00R.
Kopilavitz, Ben-Zion: *See*—
Toor, Yair; Rouso, Haim; and Kopilavitz, Ben-Zion, 4,161,035, Cl. 364-900.000.
Koppl, Franz: *See*—
Goppinger, Alois; Griesshammer, Rudolf; Hamster, Helmut; and Koppl, Franz, 4,160,797, Cl. 264-81.000.
Koski, William E.: *See*—
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,820, Cl. 424-48.000.
Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V. Pneumatic impact mechanism. 4,160,486, Cl. 173-135.000.
Kosyak, Anatoly F.: *See*—
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., 4,160,365, Cl. 60-606.000.
Kotzur, Frank W.; and Zajac, Ronald E., to Windings, Inc. Container with octagonal insert and corner payout. 4,160,533, Cl. 242-137.100.
Kovacs, Andrew J. Method and apparatus for removal of pollutants from waste water. 4,160,723, Cl. 210-7.000.
Koval, Stephen F., to Jennmar Corporation. Expansion shell assembly and method for combining resin bonding and mechanical anchoring of a bolt in a rock formation. 4,160,614, Cl. 405-259.000.
Kovalevsky, Evgeny S.: *See*—
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., 4,160,365, Cl. 60-606.000.
Kovatchev, Stephan: *See*—
Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephan, 4,160,773, Cl. 260-403.000.
Kraft, Paul; and Silberberg, Joseph, to Stauffer Chemical Company. Fire retardant blend of interpolymer composition, chlorinated vinyl chloride polymer and vinyl chloride polymer. 4,160,793, Cl. 525-230.000.
Kramlinger, Philip J.: *See*—
Hackbarth, Richard W.; Puariea, Douglas A.; and Kramlinger, Philip J., 4,160,420, Cl. 105-367.000.
Kratos Limited: *See*—
Davey, Julian P., 4,160,905, Cl. 250-311.000.
Kreienbuehl, Claude: *See*—
Heiniger, Wilfred; Kreienbuehl, Claude; and Millan, Manuel, 4,160,587, Cl. 354-25.000.
Kremlev, Vyacheslav Y.: *See*—
Nazarian, Artashes R.; Kremlev, Vyacheslav Y.; Kokin, Vilyam N.; and Manzha, Nikolai M., 4,160,918, Cl. 307-205.000.
Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. 2-Ketopentafluoropropanesulfonic acid and related acids. 4,160,780, Cl. 260-513.00F.
Kreuter, Walter: *See*—
Dorner, Armin; and Kreuter, Walter, 4,160,701, Cl. 196-116.000.
Krogsrud, Jens C., to Jac. Jacobsen A/S. Counterbalanced arm. 4,160,536, Cl. 248-280.100.
Kromer, Karl: *See*—
Noack, Rolf; and Kromer, Karl, 4,160,592, Cl. 354-246.000.
Kubono, Takashi, to Toyo Kogyo Company Limited; and Tanaka Instrument Company Limited. Centrifugal clutch and drive mechanism for remote control apparatus. 4,160,389, Cl. 74-89.180.
Kubota, Ltd.: *See*—
Nagasaki, Katsumi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; Yano, Akifumi; and Momose, Tetsuo, 4,160,662, Cl. 75-24.000.
Kudlich, Walter; Herrmann, Hans; Lechner, Gunther; and Berger, Kurt, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grund-

stoffe mbH. Packaging unit for semiconductor discs. 4,160,504, Cl. 206-334.000.
Kuether, Christian L.; and Kuether, Edith L. Bath chair. 4,160,292, Cl. 4-146.000.
Kuether, Edith L.: *See*—
Kuether, Christian L.; and Kuether, Edith L., 4,160,292, Cl. 4-146.000.
Kugler, Jindrich: *See*—
Zimmermann, Detlef; Demircioglu, Sayman F.; and Kugler, Jindrich, 4,161,008, Cl. 361-56.000.
Kuklin, Ivan A.: *See*—
Sendov, Stoyan H.; Evtimov, Stoyan I.; Nikolov, van A.; Kuklin, Ivan A.; Mirchev, Mircho G.; and Dimov, NikolasS., 4,160,647, Cl. 422-106.000.
Kunz, Paul. Pressure vessel and method for cooking food in a pressure vessel. 4,160,445, Cl. 126-369.100.
Kunze, Dieter; Leonhardt, Ernst; and Noack, Christian, to VEB Kombinat Fortschritt Landmaschinen. Engine cooling system for an agricultural vehicle. 4,160,487, Cl. 180-68.00R.
Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., to Olin Corporation. In situ reduction of electrode overvoltage. 4,160,704, Cl. 204-32.00R.
Kupka, Rudolph J. Ski scooter. 4,160,552, Cl. 280-21.00R.
Kuroda, Minoru, to Nishizawa Shoji Ltd.; and Dimension Weld International Corporation, The. Method of making an applique article. 4,160,685, Cl. 156-219.000.
Kuroda, Osamu: *See*—
Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, 4,160,713, Cl. 204-180.00P.
Kuzmin, Sergei V.: *See*—
Seleznev, Jury E.; Burkin, Jury A.; and Kuzmin, Sergei V., 4,161,037, Cl. 365-51.000.
Kuznetsov, Andrei L.: *See*—
Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N., 4,160,640, Cl. 431-9.000.
Kydonieus, Agis F.: *See*—
Von Kohorn, Henry; and Kydonieus, Agis F., 4,160,335, Cl. 43-131.000.
Kyle, Gordon L. Convertable chair. 4,160,564, Cl. 297-131.000.
Kyushu Refractories Co., Ltd.: *See*—
Watanabe, Akira; Sugimoto, Tetsuya; and Makino, Yasuhiro, 4,160,744, Cl. 252-440.000.
Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, to Ciba-Geigy Corporation. Novel insecticides. 4,160,831, Cl. 424-248.560.
Laanio, Verena; Brechbuhler, Hans U.; and Berrer, Dagmar, to Ciba-Geigy Corporation. Novel insecticides. 4,160,832, Cl. 424-248.560.
Laboratory Biochimici Fargal-Pharmasint S.p.A.: *See*—
Fischetti, Ignazio, 4,160,826, Cl. 424-180.000.
Lacroix, Jacques. Connecting device for achieving the electrical junction and mechanical assembly of at least two conductors. 4,160,871, Cl. 174-84.00R.
Lacroix, Serge: *See*—
Navaro, Gerard; Maillard, Jean-Pierre; and Lacroix, Serge, 4,160,717, Cl. 204-279.000.
Ladd, Glenn O., Jr.; and Cleary, Frederick W., to Hughes Aircraft Company. Schottky-gate field-effect transistor and fabrication process therefor. 4,160,984, Cl. 357-22.000.
Lade Metall A/S: *See*—
Hveding, Arne, 4,160,611, Cl. 405-2.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Pivard, Claude, 4,160,651, Cl. 55-26.000.
Lamb, Philip W. J.: *See*—
Barton, Peter; and Lamb, Philip W. J., 4,160,547, Cl. 271-275.000.
Lambe, John J.; and McCarthy, Shaun L., to Ford Motor Company. Solid state source of radiant energy having a controllable frequency spectra characteristic. 4,160,931, Cl. 313-498.000.
Lambelet, Percy, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Apparatus for continuously marking an insulated conductor. 4,160,426, Cl. 118-323.000.
La Mell, Kenneth; and Schneider, Gerry, to ADCO Venetian Blind Company. Alarm apparatus for movable barrier members. 4,160,972, Cl. 340-541.000.
Lamm, Jury A.: *See*—
Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N., 4,160,640, Cl. 431-9.000.
Lane, Alan J.: *See*—
McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,160,566, Cl. 299-30.000.
Langenbeck, Peter: *See*—
Stemmler, Kurt; Langenbeck, Peter; and Ehlscheid, Gunter, 4,160,894, Cl. 219-121.00L.
Lapointe, Joseph A., to Domtar Inc. Power infeed for chipper. 4,160,471, Cl. 144-176.000.
Larson, Ivar W.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.
Laughton, Richard V., to Ontario Research Foundation. Waste water treatment. 4,160,724, Cl. 210-7.000.
Lavigne, Joe B., to Chevron Research Company. Lactones. 4,160,770, Cl. 260-343.30P.
Law, James T., to Ferranti Limited. Heater for heating fluid in a body cavity. 4,160,455, Cl. 128-400.000.
Lawson, William E.: *See*—
Harken, Peter O.; and Lawson, William E., 4,160,541, Cl. 254-192.000.
Lechner, Gunther: *See*—
Kudlich, Walter; Herrmann, Hans; Lechner, Gunther; and Berger, Kurt, 4,160,504, Cl. 206-334.000.
Lee, Thomas B. K.: *See*—
McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., 4,160,781, Cl. 260-544.00D.
Leeds & Northrup Company: *See*—
Davis, Frederick B., 3rd; and Ross, Charles W., 4,161,028, Cl. 364-492.000.
Leggett & Platt, Incorporated: *See*—
Higgins, Larry, 4,160,544, Cl. 267-166.000.
Le Noane, Georges E.; and Mathern, Andre M. Device for terminating the fibers of an optical fiber ribbon with connectors. 4,160,580, Cl. 350-96.210.
Leonhardt, Ernst: *See*—
Kunze, Dieter; Leonhardt, Ernst; and Noack, Christian, 4,160,487, Cl. 180-68.00R.
Les Produits Associates LPA SA: *See*—
Jousson, Pierre J., 4,160,466, Cl. 138-115.000.
Leslie, James B.: *See*—
Chapman, Harvey A.; Fowler, John S.; Huang, John C. P.; and Leslie, James B., 4,160,348, Cl. 52-202.000.
Letter, Eugene C.: *See*—
Dey, Thomas W.; Howe, James D.; and Letter, Eugene C., 4,161,014, Cl. 362-263.000.
Dey, Thomas W.; and Letter, Eugene C., 4,161,015, Cl. 362-263.000.
Levett, Albert M. Plant protection device. 4,160,340, Cl. 47-27.000.
Levy, Richard C.: *See*—
Dankman, Scott; Levy, Richard C.; and McCoy, Bryan, 4,160,339, Cl. 46-232.000.
Lewis, Robert A.; and Honnen, Lewis R., to Chevron Research Company. Fuel compositions containing deposit control additives. 4,160,648, Cl. 44-63.000.
Lienert, Hans-Jurgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, to Bayer Aktiengesellschaft. Process for the production of plastics/metal composites. 4,160,851, Cl. 427-379.000.
Lindahl, Jonas A. I.; Tiberg, Ernst B.; and Haggstrom, Sten L., to Mo och Domsjo Aktiebolag. Process for the bleaching of cellulose pulp. 4,160,693, Cl. 162-24.000.
Linde Aktiengesellschaft: *See*—
Dorner, Armin; and Kreuter, Walter, 4,160,701, Cl. 196-116.000.
Lindgren, Mats, to Fiber Mechanics AB. Fibre-reinforced rotor. 4,160,521, Cl. 233-27.000.
Lindsey, Keith E.; and Bozeman, Hoyt W., Jr., to Lindsey Manufacturing Company. Fast action disconnect for use on a dog nut of a power line insulator and the like. 4,160,540, Cl. 254-134.3PA.
Lindsey Manufacturing Company: *See*—
Lindsey, Keith E.; and Bozeman, Hoyt W., Jr., 4,160,540, Cl. 254-134.3PA.
Lippold, Hans-Martin: *See*—
Schneider, Gerhard; Riedl, Werner; and Lippold, Hans-Martin, 4,160,747, Cl. 252-506.000.
Lirones, Nick G., to Howmet Turbine Components Corporation. Melting furnace constructions. 4,160,796, Cl. 264-60.000.
Litton Industrial Products, Inc.: *See*—
Mann, Stanley L.; and Rettig, Charles E., 4,161,010, Cl. 361-79.000.
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Marroquin, Emilio R., 4,160,300, Cl. 10-7.000.
Locey, Mark M.; and Gottermeier, William F., to Eastman Kodak Company. Maintaining planarity in polyester film during uniform temperature heat relaxation. 4,160,799, Cl. 264-342.00R.
Loges, Hans-Joachim: *See*—
Wilkening, Hermann; and Loges, Hans-Joachim, 4,160,371, Cl. 72-147.000.
Logisticon, Inc.: *See*—
Blakeslee, Thomas R., 4,160,488, Cl. 180-168.000.
Logsdon, Duane D., to Logsdon Foundation, The. Roof flashing structure. 4,160,347, Cl. 52-199.000.
Logsdon Foundation, The: *See*—
Logsdon, Duane D., 4,160,347, Cl. 52-199.000.
Logue, Robert W.: *See*—
Bexten, Eugen; Logue, Robert W.; and Wiebe, Ken J., 4,160,490, Cl. 180-133.000.
Lomik, Alexander: *See*—
Farnam, Robert G.; and Lomik, Alexander, 4,160,561, Cl. 293-1.000.
Lone Star Industries: *See*—
Sawyer, James L., 4,160,674, Cl. 106-89.000.
Long, Warner D.; Hager, Charles C.; and Hempenstall, George T. Mobile catalyst treatment unit. 4,160,806, Cl. 422-223.000.
Lorenz, Otto, to Bayer Aktiengesellschaft. Process for the production of polyamide-polyureas and dispersions thereof in water. 4,160,753, Cl. 260-29.2TN.
Loudas, Basil L., to Minnesota Mining and Manufacturing Company. Fluorochemical compound useful for textile treatment. 4,160,777, Cl. 260-456.00F.
LRS Research Limited: *See*—
Taylor, Lauren P.; and Petroski, Alex, 4,160,734, Cl. 210-96.100.

Lucas Industries Limited: *See—*
Beech, Keith J. W., 4,160,967, Cl. 336-209.000.

Luck, John V.: *See—*
Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., 4,160,850, Cl. 426-601.000.

Lukac, Frederick S.; and Zbryski, William P., to Allegheny Ludlum Industries, Inc. Method of processing alloy steel strip. 4,160,677, Cl. 134-9.000.

Luke, Douglas V., to Smiths Industries Limited. Pressure-responsive apparatus. 4,160,600, Cl. 356-352.000.

Lumba, Vijay K.: *See—*
Courtney, Thomas; and Lumba, Vijay K., 4,160,308, Cl. 29-588.000.

Lundberg, Bo E. O.; and Scuka, Victor, to Telefonaktiebolaget L M Ericsson. Self-floating cable for marine operations. 4,160,872, Cl. 174-101.500.

Lundberg, Robert D.: *See—*
Bock, Jan; Lundberg, Robert D.; and Makowski, Henry S., 4,160,751, Cl. 260-23.50A.

Lutz, Michael A.: *See—*
Harvey, Robin J.; and Lutz, Michael A., 4,161,009, Cl. 361-56.000.

Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., to Acushnet Company. Golf ball trajectory presentation system. 4,160,942, Cl. 350-120.000.

Lynch, Patrick J.: *See—*
Brindle, Dannie K.; and Shanfelt, Donald Y., 4,160,443, Cl. 126-270.000.

Lyons, Michael R. J.: *See—*
Brittain, Philip I.; and Lyons, Michael R. J., 4,160,375, Cl. 73-104.000.

Lyons, Paul; Zant, Fred; and Resnick, Charles, to Ned Strongin Associates, Inc. Sound emitting and wetting doll. 4,160,338, Cl. 46-44.000.

Lysaght Durham Chemical Company Proprietary Limited, The: *See—*
Christesen, Paul J.; and Sanders, Geoffrey R., 4,160,668, Cl. 96-1.800.

M E P & I Corporation: *See—*
Sullivan, Ronald L.; and Cosentino, Ronald R., 4,160,879, Cl. 179-90.0AN.

Mach, Joseph F.: *See—*
Bartholomew, Roger F.; Mach, Joseph F.; and Wu, Che-Kuang, 4,160,654, Cl. 65-30.00E.

MacKay, Kenneth D.: *See—*
Virnig, Michael J.; and MacKay, Kenneth D., 4,160,807, Cl. 423-24.000.

Maeda, Hidetoshi; and Ohba, Toshihiro, to Sharp Kabushiki Kaisha. Touch sensitive electronic switching circuit for electronic wristwatches. 4,160,923, Cl. 307-308.000.

Maeda, Keisuke: *See—*
Inagaki, Tetsuhiko; and Maeda, Keisuke, 4,160,983, Cl. 354-234.000.

Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N. Method of fuel burning in combustion chambers and annular combustion chamber for carrying same into effect. 4,160,640, Cl. 431-9.000.

Maffet, Vere, to UOP Inc. Mechanical dewatering process. 4,160,732, Cl. 210-75.000.

Magherini, Dino. Injection molding apparatus for the manufacture of zippers. 4,160,636, Cl. 425-129.00R.

Maier, Ludwig, to Ciba-Geigy Corporation. Process for the production of methylaminomethylphosphonic acid and its salts. 4,160,779, Cl. 260-502.500.

Maillard, Jean-Pierre: *See—*
Navaro, Gerard; Maillard, Jean-Pierre; and Lacroix, Serge, 4,160,717, Cl. 204-279.000.

Maine, Stephen G. T., to General Instrument Corporation. R.F. modulator for use in T.V. games. 4,160,959, Cl. 332-31.00T.

Mais, James W.; Bianchi, David L.; and Barker, Theodore L., to A-T-O Inc. Front flap opener. 4,160,351, Cl. 53-76.000.

Makino, Yasuhiro: *See—*
Watanabe, Akira; Sugimoto, Tetsuya; and Makino, Yasuhiro, 4,160,744, Cl. 252-440.000.

Makino, Yoichi, to NGK Spark Plug Co., Ltd. Ceramic heating element with restivity adjusted to a certain value. 4,160,897, Cl. 219-543.000.

Makowski, Henry S.: *See—*
Bock, Jan; Lundberg, Robert D.; and Makowski, Henry S., 4,160,751, Cl. 260-23.50A.

Malcon Research & Development Corporation: *See—*
Rashkin, Jay A., 4,160,746, Cl. 252-468.000.

Malone, Fermer A., Jr.: *See—*
Malone, Fermer A., Sr.; and Malone, Fermer A., Jr., 4,160,528, Cl. 242-56.00R.

Malone, Fermer A., Sr.; and Malone, Fermer A., Jr., to F. A. Malone & Son, Inc. Carpet roll winding apparatus. 4,160,528, Cl. 242-56.00R.

Manly, Thomas D.: *See—*
Hildon, Anthony M.; Manly, Thomas D.; and Jaggers, Alan J., 4,160,778, Cl. 260-502.00R.

Mann, Stanley L.; and Rettig, Charles E., to Litton Industrial Products, Inc. Commutation sensor circuit for a DC-to-DC silicon controlled rectifier (SCR) chopper circuit. 4,161,010, Cl. 361-79.000.

Manns, William G., to Texas Instruments Incorporated. Metal-dielectric electron beam scanning stack. 4,160,310, Cl. 29-25.140.

Manzha, Nikolai M.: *See—*
Nazarian, Artashes R.; Kremlev, Vyacheslav Y.; Kokin, Vilyam N.; and Manzha, Nikolai M., 4,160,918, Cl. 307-205.000.

Marcellus, Donald O. Awning control apparatus. 4,160,458, Cl. 135-5.0AT.

Marchner, Jan; and Sundberg, Yngve, to ASEA Aktiebolag. Apparatus and method for melting ferrous pellets. 4,160,868, Cl. 13-11.000.

Markel, Richard F.; and Goldberger, W. M., to Graphite Synthesis Company. Method for heat treating carbonaceous material in a fluidized bed. 4,160,813, Cl. 423-448.000.

Markina, Ljudmila S.: *See—*
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.

Markusch, Peter: *See—*
Lienert, Hans-Jurgen; Kleimann, Helmut; Dieterich, Dieter; von Bonin, Wulf; Friederich, Klaus; and Markusch, Peter, 4,160,851, Cl. 427-379.000.

Marmon Company: *See—*
Schrecongost, Ray B., 4,160,400, Cl. 84-1.130.

Marquess, Richard D., to Systron-Donner Corporation. Stable preload shock mounted bearing assembly. 4,160,568, Cl. 308-159.000.

Marroquin, Emilio R., to Litton Systems, Inc. Hammer for forming an undercut fastener driving slot. 4,160,300, Cl. 10-7.000.

Marsh, Paul G., to Black Clawson Fibreclaim, Inc. Recovery of plastic from municipal waste. 4,160,722, Cl. 209-4.000.

Martens, Alan; Radkevich, Thomas J.; and Smith, Jack R., to Westinghouse Electric Corp. Gas turbine and combined cycle power plant having reduced emission of nitrogen oxide and improved coolant injection flow control system therefor. 4,160,362, Cl. 60-39.18B.

Martin, Robert E.; and Hagan, Ernest P., Jr., to Texas Eastern Engineering, Ltd. Method and apparatus for handling the fluids in a two-phase flow pipeline system. 4,160,652, Cl. 55-46.000.

Martin, Rodger L.; and Nadwodny, Donald P. Racquet grip fitter system. 4,160,327, Cl. 33-174.00D.

Martinson, Lloyd W., to RCA Corporation. Correlator/convolver using a second shift register to rotate sample values. 4,161,033, Cl. 364-728.000.

Marubishi Yuka Kogyo Kabushiki Kaisha: *See—*
Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yugi, 4,160,711, Cl. 204-152.000.

Maruhashi, Shigeaki; and Kobayashi, Yoshio, to Nisshin Steel Co. Ltd. Process for producing ultra-low carbon stainless steel. 4,160,664, Cl. 75-49.000.

Marvin Glass & Associates: *See—*
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,160,548, Cl. 273-1.00M.

Mason, Charles D.; and Flood, Paul W., to Allied Chemical Corporation. High impact nylon molding compositions. 4,160,790, Cl. 525-179.000.

Mason, Marvin S.: *See—*
Bojanek, Robert J.; and Mason, Marvin S., 4,160,876, Cl. 179-15.0AT.

Massachusetts Institute of Technology: *See—*
Berlin, Edwin P., Jr., 4,160,973, Cl. 340-718.000.
Grodzinsky, Alan J.; and Shoenfeld, Norman A., 4,161,013, Cl. 361-433.000.

Mathern, Andre M.: *See—*
Le Noane, Georges E.; and Mathern, Andre M., 4,160,580, Cl. 350-96.210.

Mathews, Bernard C. Drive for mower. 4,160,356, Cl. 56-192.000.

Matson Navigation Company: *See—*
Montgomery, Murray M.; Gilger, William F.; and Steiner, William W., 4,160,617, Cl. 414-139.000.

Matsudaira, Nobufumi: *See—*
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.

Matsumoto, Katsuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Seat belt device. 4,160,565, Cl. 297-483.000.

Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, to Bridgestone Tire Co., Ltd. Perlite sound absorbing plate and sound insulating wall composed of the same. 4,160,491, Cl. 181-284.000.

Matsuoka, Saburo: *See—*
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, 4,160,431, Cl. 123-75.00B.

Matsuura, Shigeo; Nagashima, Toshio; and Shinagawa, Mitsuhisa, to Hitachi, Ltd. Self-oscillation mixer circuits. 4,160,953, Cl. 325-440.000.

Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, to Hitachi, Ltd.; and Hitachi Plant Engineering and Construction Co., Ltd. Process for electro-dialysis. 4,160,713, Cl. 204-180.00P.

Matsuzaki, Kazunari: *See—*
Suzuki, Toyotoshi; and Matsuzaki, Kazunari, 4,160,591, Cl. 354-235.000.

Matzner, Peter; and Schulze, Ehrhart, to Felix Stiegler Maschinenfabrik. Apparatus for the perforation of tracks of goods. 4,160,396, Cl. 83-100.000.

Maus, Otfrid: *See—*
Guyot, Volker; Maus, Otfrid; and Muller, Martin, 4,160,384, Cl. 73-462.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephan, 4,160,773, Cl. 260-403.000.

Maxson Corporation, The: *See—*
Hackbarth, Richard W.; Puariea, Douglas A.; and Kramlinger, Philip J., 4,160,420, Cl. 105-367.000.

McCabe, John M.; and Yoerger, William E., to Eastman Kodak Company. Polymeric chemical sensitizers for organic photoconductive compositions. 4,160,666, Cl. 96-1.0PC.

McCambridge, Joseph. Fluid-dynamic emergency brakes. 4,160,494, Cl. 188-270.000.

McCarthy, Shaun L.: *See—*
Lambe, John J.; and McCarthy, Shaun L., 4,160,931, Cl. 313-498.000.

McCoy, Bryan: *See—*
Dankman, Scott; Levy, Richard C.; and McCoy, Bryan, 4,160,339, Cl. 46-232.000.

McCrea, Donald H.: *See—*
Benson, Homer E.; and McCrea, Donald H., 4,160,810, Cl. 423-220.000.

McCullough, John E.: *See—*
Hidden, William P.; and McCullough, John E., 4,160,629, Cl. 418-55.000.

McFadden, Arthur R.; Allen, Richard C.; and Lee, Thomas B. K., to American Hoechst Corporation. 4-Benzyloxy-3-(chlorocarbonyl)-phenylacetyl chloride. 4,160,781, Cl. 260-544.00D.

McFayden, Dennis G., to California Instruments Corporation. Autozeroed ohmmeter. 4,160,949, Cl. 324-62.000.

McGee, Dean A.; Ingle, James E.; and Lane, Alan J., to Kerr-McGee Corporation. Mining apparatus. 4,160,566, Cl. 299-30.000.

McGregor, Adrienne R.: *See—*
Smith, David S.; and McGregor, Adrienne R., 4,160,818, Cl. 424-8.000.

McIntire, John M.: *See—*
Ponticello, Ignazio S.; and McIntire, John M., 4,160,864, Cl. 560-2.000.

McKechnie, John C.; and Berke, Herbert, to United States of America, Navy. Electro-optical radio system. 4,160,903, Cl. 250-199.000.

McLean, Douglas H., to Ford Motor Company. Tractor with draft load control system. 4,160,485, Cl. 172-9.000.

McMillan, Andrew H.; and Wisner, Daniel A., to Burroughs Corporation. Document overlap-detecting apparatus and process. 4,160,546, Cl. 271-263.000.

Melcher Manufacturing Co., Inc.: *See—*
Hilbern, Tom, 4,160,299, Cl. 9-347.000.

Melehy, Mahmoud A.: *See—*
Jain, Faquir C.; and Melehy, Mahmoud A., 4,160,678, Cl. 136-89.0SJ.

Mendrala, James A., to Sonex International Corp. Luminance key amplifier. 4,160,994, Cl. 358-22.000.

Merck & Co., Inc.: *See—*
Cole, Douglas L.; and Goegelman, Robert T., 4,160,861, Cl. 536-17.00A.
Saari, Walfred S.; and Huff, Joel R., 4,160,712, Cl. 204-158.00R.
Stone, Clement A., 4,160,835, Cl. 424-263.000.

Merrell, Richard G., to Zenith Radio Corporation. VIR line recognition system. 4,160,993, Cl. 358-21.00V.

Merz, Walter, to Swiss Aluminium Ltd. Pneumatic unloading device. 4,160,567, Cl. 406-98.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Tuscher, Otto; Butter, Karl; and Knauer, Kuno, 4,160,709, Cl. 204-49.000.

Meyen, Robert H.; Puttlitz, Karl J.; Schink, Karl; and Wenskus, Herbert, to International Business Machines Corporation. Individual chip joining machine. 4,160,893, Cl. 219-85.0BA.

Meyer, Richard J.: *See—*
Bergman, Roland H.; Meyer, Richard J.; and Fortman, Richard F., 4,160,372, Cl. 72-404.000.

Meyer, Stephen F.: *See—*
Wright, Duane H., deceased; and Meyer, Stephen F., 4,160,886, Cl. 200-5.00A.

Microtel B.V.: *See—*
Smulders, Adrianus J., 4,160,881, Cl. 179-111.00E.

Miesel, John L., to Eli Lilly and Company. 1-(Substituted benzoyl)-3-(substituted pyrazinyl)ureas. 4,160,834, Cl. 424-250.000.

Mikoshiba, Shigeo; and Shinada, Shinichi, to Hitachi, Ltd. Method of driving flat discharge panel. 4,160,932, Cl. 315-169.400.

Millan, Manuel: *See—*
Heiniger, Wilfred; Kreienbuehl, Claude; and Millan, Manuel, 4,160,587, Cl. 354-25.000.

Miller, Clarence L., Jr., to Allegheny Ludlum Industries, Inc. Silicon steel and processing therefore. 4,160,681, Cl. 148-111.000.

Miller, Jack V., to Killerwatt Corporation. Fluorescent lampholder assembly for circline lamp. 4,161,020, Cl. 362-216.000.

Miller, Jean C.; and Gutowski, Gerald E., to Eli Lilly and Company. Vinca alkaloid intermediates. 4,160,767, Cl. 260-244.400.

Miller, Leo: *See—*
Vataru, Marcel; Miller, Leo; and Schwesinger, Dennis W., 4,160,461, Cl. 137-337.000.

Miller, Paul W., to Hairegenics, Inc. Apparatus for implanting hair. 4,160,453, Cl. 128-330.000.

Milliken Research Corporation: *See—*
Frentress, Zane, 4,160,359, Cl. 57-58.890.

Milton, A. Fenner, to United States of America, Navy. Tapered velocity electro-optical waveguide switch. 4,160,579, Cl. 350-96.140.

Mims, James H.; and Hopwood, Francis W., to Westinghouse Electric Corp. Sampling linearizer utilizing a phase shifter. 4,160,958, Cl. 331-178.000.

Minagawa, Motonobu; and Sekiguchi, Tetsuo, to Argus Chemical Corporation. Halogen-containing resin stabilizer comprising an alkoxycarbonylalkylenetin sulfide. 4,160,762, Cl. 260-45.75S.

Minami, Isao: *See—*
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,160,830, Cl. 424-246.000.

Mine, Kiyomitsu: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, 4,160,669, Cl. 96-27.00E.

Mininni, Robert M.: *See—*
Choe, Eui W.; Tan, Marshall; and Mininni, Robert M., 4,160,755, Cl. 260-29.60H.

Minnesota Mining and Manufacturing Company: *See—*
Chapman, Harvey A.; Fowler, John S.; Huang, John C. P.; and Leslie, James B., 4,160,348, Cl. 52-202.000.
Loudas, Basil L., 4,160,777, Cl. 260-456.00F.

Minolta Camera Kabushiki Kaisha: *See—*
Inagaki, Tetsuhiko; and Maeda, Keisuke, 4,160,983, Cl. 354-234.000.

Minster Machine Company, The: *See—*
Bergman, Roland H.; Meyer, Richard J.; and Fortman, Richard F., 4,160,372, Cl. 72-404.000.

Mirchev, Mircho G.: *See—*
Sendov, Stoyan H.; Evtimov, Stoyan I.; Nikolov, van A.; Kuklin, Ivan A.; Mirchev, Mircho G.; and Dimov, NikolasS., 4,160,647, Cl. 422-106.000.

Mischke, Peter; Fleckenstein, Erwin; and Mohr, Reinhard, to Hoechst Aktiengesellschaft. Water-insoluble monoazo-dyestuffs for synthetic fibrous materials. 4,160,764, Cl. 260-206.000.

Miskolczy, Gabor; Nowak, Leonard G.; and Shefsiek, Paul K., to Holcroft & Company. Continuous furnace. 4,160,641, Cl. 432-59.000.

Mitchell, James; and Pye, Thomas N., to Henry Balfour & Company Limited. Wiped film evaporators. 4,160,692, Cl. 159-6.00W.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Akamatsu, Masahiko, 4,160,938, Cl. 318-82.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Tsubai, Yasuo; Iguchi, Shigeru; Suzuki, Shigeyoshi; and Iwata, Tamotsu, 4,160,670, Cl. 96-119.00R.

Miyabayashi, Susumu: *See—*
Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.

Miyairi, Sachio; Tanaka, Hideaki; Yabe, Akira; and Honda, Koichi, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Enzyme immobilization with azido compounds. 4,160,698, Cl. 435-173.000.

Miyanishi, Toshiaki: *See—*
Inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyanishi, Toshiaki, 4,160,824, Cl. 424-84.000.

Mizuuchi, Katsumi: *See—*
Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, 4,160,387, Cl. 73-639.000.

Mo och Domsjo Aktiebolag: *See—*
Lindahl, Jonas A. I.; Tiberg, Ernst B.; and Haggstrom, Sten L., 4,160,693, Cl. 162-24.000.

Mobil Oil Corporation: *See—*
Young, Lewis B., 4,160,788, Cl. 585-475.000.

Mohr, Reinhard: *See—*
Mischke, Peter; Fleckenstein, Erwin; and Mohr, Reinhard, 4,160,764, Cl. 260-206.000.

Moll, Manfred; Flayeux, Roland; Dicesare, Pierre; and Gross, Bernard, to G.I.E. Tepral. Process for extracting bitter flavoring principles from hops. 4,160,787, Cl. 260-586.00D.

Momose, Tetsuo: *See—*
Nagasaki, Katsumi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; Yano, Akifumi; and Momose, Tetsuo, 4,160,662, Cl. 75-24.000.

Monitek, Inc.: *See—*
Wynn, William H., 4,160,914, Cl. 250-574.000.

Monks, Harry, to Coal Industry (Patents) Limited. Auxiliary drive mechanism. 4,160,391, Cl. 74-661.000.

Monroe, Gordon E.: *See—*
Peterson, Donald L.; and Monroe, Gordon E., 4,160,357, Cl. 56-329.000.

Monroe, Tex K., to GTE Sylvania Incorporated. Fast-start vertical current feedback circuit. 4,160,936, Cl. 315-388.000.

Monsanto Company: *See—*
D'Amico, John J., 4,160,658, Cl. 71-90.000.

Montagnino, James G.; and Staudinger, Frederick J., to Pitney-Bowes, Inc. Detent remover for a postage meter. 4,160,899, Cl. 235-101.000.

Montgomery, Murray M.; Gilger, William F.; and Steiner, William W., to Matson Navigation Company. Container conveyor apparatus and method for vessel loading crane-yard interface. 4,160,617, Cl. 414-139.000.

Moon, John P.: *See—*
Tandon, Sirjang L.; and Moon, John P., 4,160,315, Cl. 29-603.000.

Moore, Randall W.: *See—*
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Butler, Eric W.; and Moulds, Clinton W., III, 4,161,041, Cl. 365-244.000.
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Drewett, Robert J., 4,160,979, Cl. 343-788.000.
Jones, Barry E.; and Smith, John A., 4,160,971, Cl. 340-152.00T.
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Neff, Elias, to Antioch Bookplate Company. Packaging method and apparatus. 4,160,352, Cl. 53-137.000.
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Nelson, Duane A. Marine engine cooling water filter cleaning system. 4,160,733, Cl. 210-85.000.
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Neubaum, August E., to Pitney Bowes Deutschland GmbH. Ink ribbon box. 4,160,605, Cl. 400-208.000.
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Newell, Robert C.; and Kinning, Robert F., to Dan River Incorporated. Stitch counter for a sewing machine. 4,160,424, Cl. 112-275.000.
Newton, Paul P.; and Olsen, Robert A., to Warner Electric Brake & Clutch Company. Electromagnetic coupling. 4,160,498, Cl. 192-84.00C.
NFE International, Ltd.: *See—*
Jensen, Brian J., 4,160,650, Cl. 51-16.000.
NGK Spark Plug Co., Ltd.: *See—*
Makino, Yoichi, 4,160,897, Cl. 219-543.000.
Nguyen, Xuan T., to Domtar Inc. Process for mercury removal. 4,160,730, Cl. 210-48.000.
Nicholson, Richard R.: *See—*
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Nickels, Joseph J., Jr., to Van-Packer Co. Reinforce tee section for chimney. 4,160,559, Cl. 285-156.000.
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Niederdellmann, Georg; Quiring, Bernd; and Thoma, Wilhelm, to Bayer Aktiengesellschaft. Method of reverse coating textile sheets with polyurethene. 4,160,686, Cl. 156-331.000.
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Niemann, James E., to American Standard Inc. Drain valve assembly. 4,160,293, Cl. 4-295.000.
Nigra, Jacques; and Vanthuyne, Guy, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Switchable high voltage generator for penetration-type color CRT. 4,160,996, Cl. 358-73.000.
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Baba, Masanao, 4,160,499, Cl. 192-0.098.
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Nishizawa Shoji Ltd.: *See—*
Kuroda, Minoru, 4,160,685, Cl. 156-219.000.
Nissan Motor Company, Limited: *See—*
Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, 4,160,392, Cl. 74-732.000.
Tsutsumi, Saburo, 4,160,432, Cl. 123-75.00B.
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Maruhashi, Shigeaki; and Kobayashi, Yoshio, 4,160,664, Cl. 75-49.000.
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Noack, Rolf; and Kromer, Karl, to Veb Pentacon Dresden Kamera und Kinowerke. Cameras. 4,160,592, Cl. 354-246.000.
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Northern Telecom Limited: *See*—
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Northwestern University: *See*—
Carr, Stephen H.; and Stupp, Samuel I., 4,160,760, Cl. 260-42.210.
Norwood Marking & Equipment Co.: *See*—
Fichter, Robert, 4,160,410, Cl. 101-41.000.
Novy, Russell F.; Scott, Gerald L.; and Zurfluh, Thomas O., to Sola Basic Industries, Inc. Vacuum carburizing. 4,160,680, Cl. 148-16.500.
Nowacki, Ulrich G., to International Paper Company. Method and apparatus for erecting a carton. 4,160,406, Cl. 93-36.300.
Nowak, Leonard G.: *See*—
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Nu Watt, Inc.: *See*—
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Oberg, Hans-Jurgen: *See*—
Stockel, Dieter; and Oberg, Hans-Jurgen, 4,160,855, Cl. 428-621.000.
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Okolelova, Klavdia A.: *See*—
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Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including boolean flag variable means. 4,161,031, Cl. 364-709.000.
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Kuo, Han C.; Ahn, Byung K.; Dotson, Ronald L.; and Woodard, Kenneth E., Jr., 4,160,704, Cl. 204-32.00R.
Pryor, Michael J.; and Tyler, Derek E., 4,160,474, Cl. 164-73.000.
Scardera, Michael; and Gavin, David F., 4,160,776, Cl. 260-448.80R.
Ollinger, Max, to Siemens Aktiengesellschaft. Process for signaling an interruption in the state of readiness for the reception in data terminal devices in which data are exchanged. 4,160,874, Cl. 178-69.00G.
Olsen, Robert A.: *See*—
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Olson, Donel R., to Olson Engineering Inc. Modulating air control valve. 4,160,433, Cl. 123-124.00R.
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Olympus Optical Co., Ltd.: *See*—
Fujimori, Ryo; and Ito, Hiromi, 4,160,896, Cl. 219-216.000.
Osanai, Akira, 4,161,006, Cl. 360-137.000.
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Onizaki, Yasushi: *See*—
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
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Laughton, Richard V., 4,160,724, Cl. 210-7.000.
Opderbek, Fritz: *See*—
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbek, Fritz; and Brachthauser, Karl-Heinz, 4,160,695, Cl. 435-101.000.
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Orr, Thomas S. C.; and Keogh, Raymond W., to Fisons Limited. Method. 4,160,844, Cl. 424-283.000.
Orth, George O., Jr. Process of improving the freeze-thaw stability of fish bait. 4,160,847, Cl. 426-1.000.
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Calhoun, Michael B.; and Fredd, John V., 4,160,478, Cl. 166-55.100.
Otzen, Karl G., to Safety-Kleen Corp. Immersion cleaner. 4,160,603, Cl. 366-219.000.
Owens-Corning Fiberglas Corporation: *See*—
Carvalho, Robert L.; Canfield, Sheldon A.; and Steinbaugh, Gary, 4,160,360, Cl. 57-81.000.
Owens-Illinois, Inc.: *See*—
Rapp, James E., 4,160,672, Cl. 106-39.600.
Oxy Metal Industries Corporation: *See*—
Hacias, Kenneth J., 4,160,370, Cl. 72-42.000.
Pack, Klaus: *See*—
Hutzenlaub, Armin S. P.; and Pack, Klaus, 4,160,529, Cl. 242-56.600.
Paioni, Romeo, to Ciba-Geigy Corporation. Derivatives of perhydro-aza-heterocycles. 4,160,837, Cl. 424-267.000.
Pangos, William: *See*—
Adelberger, Donald L.; and Pangos, William, 4,160,572, Cl. 339-14.00P.
Pannekeet, Wilhelmus; and Smakman, Robert, to Akzona Incorporated. Process for purifying an aqueous solution. 4,160,675, Cl. 127-46.00A.
Papasideris, Stamos I., to Caterpillar Tractor Co. Engine stop-start electrical circuit. 4,160,916, Cl. 307-10.00R.
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Waldrop, Walter I.; Waldrop, Roy; and Paul, Cyrus, 4,160,676, Cl. 134-6.000.
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Vidal, Frederick D.; and Gerrity, Albert B., 4,160,848, Cl. 426-24.000.
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Drechsel, Erhart K., 4,160,657, Cl. 71-41.000.
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Perrey, Klaus: *See*—
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Taylor, Lauren P.; and Petroski, Alex, 4,160,734, Cl. 210-96.100.
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., to Tsentrainy Nauchno-Issiedovatelsky Dizeiny Institut. Compression ignition engine regulation system. 4,160,365, Cl. 60-606.000.
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Kelley, Carl S., 4,160,743, Cl. 252-411.00R.
Pollock, Lyle W., 4,160,719, Cl. 208-11.00R.
Piat, Jean, to Sotarem S.A. Cutting-off machine for hard bodies. 4,160,439, Cl. 125-16.00R.
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Pielkenrood, Jacob, 4,160,737, Cl. 210-202.000.
Pierce, Perry H.; and Prendergast, Dan L., to Hewlett-Packard Company. Method and apparatus for mounting printed circuit boards. 4,161,017, Cl. 361-412.000.
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Gregg, Edmund; and Pilarczyk, Charles E., 4,160,735, Cl. 210-130.000.
Pitney Bowes Deutschland GmbH: *See*—
Neubaum, August E., 4,160,605, Cl. 400-208.000.
Pitney-Bowes, Inc.: *See*—
Montagnino, James G.; and Staudinger, Frederick J., 4,160,899, Cl. 235-101.000.
Pivard, Claude, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Methods of treating a gaseous mixture of adsorption. 4,160,651, Cl. 55-26.000.
Pizzoccaro, Luigi, to Interbrev S.A. Method and an apparatus for indicating length on a zip fastener. 4,160,306, Cl. 24-205.00R.
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Brigham, Robert J.; Sirianni, Guy V.; and Garner, Andrew, 4,160,661, Cl. 75-12.000.
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Jesinger, David W., 4,160,957, Cl. 331-107.00A.
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Polaroid Corporation: *See—*
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Johnson, Bruce K.; and Whiteside, George D., 4,160,589, Cl. 354-86.000.
Reynard, John M., 4,160,590, Cl. 354-195.000.
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Pompeev, Vladimir M.: *See—*
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Pond, R. F.: *See—*
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Pool Company: *See—*
Armstrong, James E., 4,160,538, Cl. 254-89.00R.
Portmann, August T., to Bruderer AG. Drive for the movable work component, such as the ram of a press, stamping machine or the like. 4,160,409, Cl. 100-257.000.
Potts, Robert S., to Corning Glass Works. Self packaged test kit. 4,160,803, Cl. 422-101.000.
Powers, Larry J.: *See—*
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,160,768, Cl. 260-306.70T.
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Ammons, Vernon G., 4,160,853, Cl. 428-425.000.
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Pierce, Perry H.; and Prendergast, Dan L., 4,161,017, Cl. 361-412.000.
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Rossi-Ashton, Alan G., 4,160,462, Cl. 137-529.000.
Preussag Aktiengesellschaft: *See—*
Journey, William K., 4,160,623, Cl. 417-238.000.
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Derner, William J.; and Price, Connor E., 4,160,608, Cl. 403-370.000.
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Dietrichs, Hans-Hermann; Sinner, Michael; Opderbek, Fritz; and Brachthauser, Karl-Heinz, 4,160,695, Cl. 435-101.000.
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Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N., 4,160,640, Cl. 431-9.000.
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Hildon, Anthony M.; Manly, Thomas D.; and Jaggers, Alan J., 4,160,778, Cl. 260-502.00R.
Prosser, David G., to Autotrol Corporation. Rotating trickling filter. 4,160,736, Cl. 210-150.000.
Prusinski, Jan R.: *See—*
Prusinski, Richard C.; and Prusinski, Jan R., 4,160,761, Cl. 260-42.470.
Prusinski, Richard C.; and Prusinski, Jan R., to Architectural Research Corporation. Plastic articles. 4,160,761, Cl. 260-42.470.
Pryor, Michael J.; and Tyler, Derek E., to Olin Corporation. Lubrication in DC casting of copper base alloys. 4,160,474, Cl. 164-73.000.
Puariea, Douglas A.: *See—*
Hackbarth, Richard W.; Puariea, Douglas A.; and Kramlinger, Philip J., 4,160,420, Cl. 105-367.000.
Puttlitz, Karl J.: *See—*
Meyen, Robert H.; Puttlitz, Karl J.; Schink, Karl; and Wenskus, Herbert, 4,160,893, Cl. 219-85.0BA.
Putyra, Donald J. Toilet shroud. 4,160,295, Cl. 4-420.000.
Pye, Thomas N.: *See—*
Mitchell, James; and Pye, Thomas N., 4,160,692, Cl. 159-6.00W.
Pyreflex Corporation: *See—*
Berg, Oharles A., 4,160,577, Cl. 350-1.100.
Query, Grady W.; and Query, O. Grady. Method for treating fireants. 4,160,336, Cl. 43-132.00A.
Query, O. Grady: *See—*
Query, Grady W.; and Query, O. Grady, 4,160,336, Cl. 43-132.00A.
Quiring, Bernd: *See—*
Niederdellmann, Georg; Quiring, Bernd; and Thoma, Wilhelm, 4,160,686, Cl. 156-331.000.
Radford, William H., to Rolls-Royce Limited. Method of making a wax pattern for a shell mould. 4,160,313, Cl. 29-525.000.
Radici, Pierino; Bianchi, Gaudenzio; and Colombo, Paolo, to Societa' Italiana Resine S.I.R. S.p.A. Block copolymers. 4,160,789, Cl. 525-411.000.
Radiometer A/S: *See—*
Andersen, Jorgen; and Nielsen, Ole, 4,160,714, Cl. 204-195.00R.
Radkevich, Thomas J.: *See—*
Martens, Alan; Radkevich, Thomas J.; and Smith, Jack R., 4,160,362, Cl. 60-39.18B.
Raman, Manjeri S., to Calgon Corporation. Method of resolving oil-in-water emulsions. 4,160,742, Cl. 252-344.000.
Raney, Meredith T., Jr., to Harris Corporation. CRT video text layout system having horizontal scrolling. 4,160,981, Cl. 340-721.000.
Rangert, Bo: *See—*
Kallberg, Tommy K.; and Rangert, Bo, 4,160,321, Cl. 30-383.000.
Rapp, James E., to Owens-Illinois, Inc. Glass-ceramics for semiconductor doping. 4,160,672, Cl. 106-39.600.
Rashkin, Jay A., to Malcon Research & Development Corporation. Catalyst for hydrogenation of acetophenone. 4,160,746, Cl. 252-468.000.
Rasile, John: *See—*
Abolafia, Oscar R.; and Rasile, John, 4,160,691, Cl. 156-664.000.
Rauschenberger, Richard A., to Will Ross Inc. Unitary sample-vent-valve assembly. 4,160,383, Cl. 73-422.00R.
Rauschenberger, Richard A., to Will Ross Inc. Catheterization tray. 4,160,505, Cl. 206-571.000.
Raypak, Inc.: *See—*
Ashton, Larry J.; and Block, Leo, 4,160,476, Cl. 165-171.000.
Raytheon Company: *See—*
Adlerstein, Michael G., 4,160,992, Cl. 357-81.000.
Steudel, Fritz, 4,160,975, Cl. 343-16.00M.
RCA Corporation: *See—*
Ahmed, Adel A. A., 4,160,944, Cl. 323-4.000.
Curtice, Walter R., 4,160,919, Cl. 307-216.000.
Firester, Arthur H.; and Heller, Macy E., 4,160,598, Cl. 356-121.000.
Hopta, Daniel F.; and Beelitz, Howard R., 4,160,943, Cl. 323-4.000.
Martinson, Lloyd W., 4,161,033, Cl. 364-728.000.
Wardell, Myron H., Jr., 4,160,510, Cl. 220-2.10A.
Williams, Richard; and Bloom, Allen, 4,160,816, Cl. 423-648.00R.
Regie Nationale des Usines Renault: *See—*
Navaro, Gerard; Maillard, Jean-Pierre; and Lacroix, Serge, 4,160,717, Cl. 204-279.000.
Reichow, James R. Hinge joints for elongated collapsible members such as a fishing rod. 4,160,607, Cl. 403-286.000.
Reid, Robert A., to CPC Engineering Corporation. Bearing support for a lift pump. 4,160,569, Cl. 308-203.000.
Reistad, Bengt R., to Aktiebolaget Electrolux. Absorption refrigerating apparatus. 4,160,366, Cl. 62-476.000.
Rejda, Ladislav J.: *See—*
Cope, Lloyd S.; and Rejda, Ladislav J., 4,160,926, Cl. 310-215.000.
Reliable Electric Company: *See—*
Brey, William A., 4,160,880, Cl. 179-98.000.
Rendall, John S., to Rohrtil S. A. Solvent extraction process. 4,160,718, Cl. 208-11.0LE.
Renner, Alfred; and Zahir, Abdul-Cader, to Ciba-Geigy Corporation. Curable mixtures based on maleimides and acetone-anil. 4,160,859, Cl. 528-322.000.
Research Corporation: *See—*
Bucovaz, Edsel T.; Morrison, John C.; Morrison, William C.; and Whybrew, Walter D., 4,160,817, Cl. 424-1.000.
Resnick, Charles: *See—*
Lyons, Paul; Zant, Fred; and Resnick, Charles, 4,160,338, Cl. 46-44.000.
Rettig, Charles E.: *See—*
Mann, Stanley L.; and Rettig, Charles E., 4,161,010, Cl. 361-79.000.
Reynard, John M., to Polaroid Corporation. Removable (lens position limiting) stop for auto-manual focusing cameras. 4,160,590, Cl. 354-195.000.
Rice, Marjorie L. Garment hanger construction. 4,160,516, Cl. 223-98.000.
Richardson, Reginald D.; and Shannon, Robert H. Heavy oil recovery process. 4,160,479, Cl. 166-267.000.
Rickenbacker, James E., to Exxon Production Research Company. Method of generating a direct current control signal from a noisy alternating current signal. 4,160,922, Cl. 307-261.000.
Ricketts, William H.: *See—*
Scriminger, William F.; and Ricketts, William H., 4,160,632, Cl. 425-62.000.
Rideout, Vincent L.: *See—*
Dennard, Robert H.; and Rideout, Vincent L., 4,160,987, Cl. 357-41.000.
Ridgeway, John J., to Imperial Chemical Industries Limited. Shaped explosive charge device for under water use. 4,160,413, Cl. 102-24.0HC.
Riedl, Werner: *See—*
Schneider, Gerhard; Riedl, Werner; and Lippold, Hans-Martin, 4,160,747, Cl. 252-506.000.
Robert Bosch GmbH: *See—*
Kamin, Gerhard, 4,160,998, Cl. 358-105.000.
Ruoff, Manfred, 4,160,628, Cl. 417-465.000.
Robertson, Andrew D., to British Steel Corporation. Continuous charging apparatus. 4,160,869, Cl. 13-33.000.
Roccaforte, Harry I., to Champion International Corporation. Platform carton. 4,160,502, Cl. 206-45.140.
Roche, Marcel, to Thomson-CSF. Method of manufacturing field effect transistors of the MOS-type. 4,160,683, Cl. 148-187.000.
Rockford Servo Corporation: *See—*
Buisker, Raymond A., 4,160,517, Cl. 226-19.000.
Rodebush, James E.; and Thiele, Gerald H., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,160,659, Cl. 71-95.000.
Roecar Holdings (Netherlands Antilles) N.V.: *See—*
Pegel, Karl H., 4,160,860, Cl. 536-5.000.
Roedel, George F., to General Electric Company. Solventless silicone resins. 4,160,858, Cl. 528-14.000.
Roffler, Josua, to Sulzer Brothers, Ltd. Spacer grid for parallel cylindrical tubes. 4,160,477, Cl. 165-172.000.
Rohde, Hargen: *See—*
Hasenpath, Helmut; and Rohde, Hargen, 4,160,303, Cl. 15-349.000.
Rohm and Haas Company: *See—*
Desiderio, Fred A., 4,160,642, Cl. 8-12.000.

Stambaugh, Robert L.; and Galluccio, Richard A., 4,160,739, Cl. 252-34.000.
Rohrtil S. A.: *See*—
Rendall, John S., 4,160,718, Cl. 208-11.0LE.
Rolf C. Hagen (USA) Corp.: *See*—
Holbrook, Arthur J., 4,160,427, Cl. 119-5.000.
Rolls-Royce Limited: *See*—
Greenwood, Stanley W., 4,160,710, Cl. 204-129.250.
Radford, William H., 4,160,313, Cl. 29-525.000.
Ronde, Hubertus J.; and Van Loosdregt, Peter C., to U.S. Philips Corporation. Method of manufacturing a cathode ray tube for displaying colored pictures. 4,160,311, Cl. 29-25.150.
Roquette Freres: *See*—
Huchette, Michel; and Bussiere, Guy, 4,160,849, Cl. 426-94.000.
Rosenburgh, Norman J., to Eastman Kodak Company. Apparatus for developing latent images. 4,160,593, Cl. 354-317.000.
Ross, Charles W.: *See*—
Davis, Frederick B., 3rd; and Ross, Charles W., 4,161,028, Cl. 364-492.000.
Rossi-Ashton, Alan G., to Prestige Group Limited, The. Adjustable relief valves and pressure cookers incorporating such valves. 4,160,462, Cl. 137-529.000.
Rossler, Bernward, to Siemens Aktiengesellschaft. N-Channel storage FET. 4,161,039, Cl. 365-185.000.
Rouso, Haim: *See*—
Toor, Yair; Rouso, Haim; and Kopilavitz, Ben-Zion, 4,161,035, Cl. 364-900.000.
Ruoff, Manfred, to Robert Bosch GmbH. Positive displacement machine. 4,160,628, Cl. 417-465.000.
Russell, Billy D., to Electric Power Research Institute, Inc. Digital protection system for transmission lines and associated power equipment. 4,161,027, Cl. 364-492.000.
Russell, Homer C.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.
Russell, Lewis K., to Signetics Corporation. Integrated injection logic (I-squared L) with double-diffused type injector. 4,160,988, Cl. 357-44.000.
Russo, Mose A.: *See*—
Price, Lawrence; and Russo, Mose A., 4,160,798, Cl. 264-213.000.
Ryan, Wayne L., to Streck Laboratories, Inc. Platelet reference control and method of preparation. 4,160,644, Cl. 23-230.00B.
Saari, Walfred S.; and Huff, Joel R., to Merck & Co., Inc. Process for preparing novel N-carboxyl-α-amino acid anhydrides. 4,160,712, Cl. 204-158.00R.
Safety-Kleen Corp.: *See*—
Otzen, Karl G., 4,160,603, Cl. 366-219.000.
Saini, Sarmukh S., to Emerson Electric Co. Normally open, thermal sensitive electrical switching device. 4,160,968, Cl. 337-404.000.
Saint-Gobain Industries: *See*—
Bichot, Bernard H.; and Gest, Rene, 4,160,398, Cl. 83-865.000.
St. Regis Paper Company: *See*—
Brenholdt, Irving R., 4,160,913, Cl. 250-563.000.
Saito, Isao, to Sony Corporation. Power conserving motor control circuit for a video tape recorder. 4,161,002, Cl. 360-75.000.
Sakamoto, Eiichi: *See*—
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Fujimori, Noboru; and Mine, Kiyomitsu, 4,160,669, Cl. 96-27.00E.
Sakamoto, Hitoshi, to Sony Corporation. Video signal reproducing apparatus with a manually controlled track searching arrangement. 4,161,001, Cl. 360-10.000.
Sakamoto, Susumu: *See*—
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
Salisbury, John K., Jr.: *See*—
United States of America, National Aeronautics and Space Administration; and Salisbury, John K., Jr., 4,160,508, Cl. 414-4.000.
Salomon, Georges P. J., to Etablissements Francois Salomon et Fils. Ski boot. 4,160,332, Cl. 36-119.000.
Salomon, Georges P. J., to S.A. des Ets Francois Salomon & Fils. Safety bindings for skis. 4,160,555, Cl. 280-612.000.
Sanders, Geoffrey R.: *See*—
Christesen, Paul J.; and Sanders, Geoffrey R., 4,160,668, Cl. 96-1.800.
Sandoz Ltd.: *See*—
Bream, John B., 4,160,766, Cl. 260-243.300.
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Sasakura, Kazuyuki: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, 4,160,784, Cl. 260-570.0AB.
Sato, Takeo, to Fujitsu Ten Limited. Compatible AM-FM frequency discriminator. 4,160,955, Cl. 329-2.000.
Satoh, Takashi, to Hitachi, Ltd. Data-in amplifier for an MISFET memory device having a clamped output except during the write operation. 4,161,040, Cl. 365-203.000.
Saucy, Gabriel: *See*—
Chan, Ka-Kong; and Saucy, Gabriel, 4,160,865, Cl. 560-22.000.
Sawyer, James L., to Lone Star Industries. Early high-strength portland cement and method of manufacture. 4,160,674, Cl. 106-89.000.
Scardera, Michael; and Gavin, David F., to Olin Corporation. Alkoxybis (trialkoxysiloxy)-silane surfactants. 4,160,776, Cl. 260-448.80R.
Schaarschmidt, Ulrich: *See*—
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Schanen, Paul C.: *See*—
Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., 4,160,906, Cl. 250-322.000.
Schapel, Dietmar; Wagner, Kuno; Muller, Hanns P.; and Dahm, Manfred, to Bayer Aktiengesellschaft. Stable polymer gels. 4,160,754, Cl. 260-29.40R.
Scheffler, Friedrich, to AEG-Elotherm, G.m.b.H. Furnace for the inductive heating of metallic workpieces. 4,160,891, Cl. 219-10.690.
Schievelbein, Vernon H.; and Park, Jack H., to Texaco Inc. High conformance oil recovery process. 4,160,480, Cl. 166-269.000.
Schilling, Curtis L., Jr., to Union Carbide Corporation. Process for the preparation of novel organosilicon compounds. 4,160,775, Cl. 260-448.20E.
Schink, Karl: *See*—
Meyen, Robert H.; Puttlitz, Karl J.; Schink, Karl; and Wenskus, Herbert, 4,160,893, Cl. 219-85.0BA.
Schmidt, Andreas; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. 1-Oxo-2,2-[dialkylphosphono(alkyl)alkyloxy]-1,2-diphenylethane. 4,160,794, Cl. 260-927.00R.
Schneider, Gerhard; Riedl, Werner; and Lippold, Hans-Martin, to Varta Batterie Aktiengesellschaft. Electrode and manufacturing method therefor. 4,160,747, Cl. 252-506.000.
Schneider, Gerry: *See*—
La Mell, Kenneth; and Schneider, Gerry, 4,160,972, Cl. 340-541.000.
Schneider, Gottfried; Wagner, Kuno; and Dietrich, Werner, to Bayer Aktiengesellschaft. Process for dissociating polyurethane resins. 4,160,749, Cl. 260-2.300.
Scholl, Hans; and Tiemann, Helmut, to Kochs Adler AG. Device for making slit facings of a garment. 4,160,423, Cl. 112-121.120.
Scholle Corporation: *See*—
Scholle, William R., 4,160,309, Cl. 29-2.000.
Scholle, William R., to Scholle Corporation. Method and apparatus for making battery grids. 4,160,309, Cl. 29-2.000.
Schorr, Ian A., to Wescom, Inc. High efficiency switching regulator. 4,160,945, Cl. 323-17.000.
Schraut, Eugene H., to Vari-Tronics Co. Telephone cord connector. 4,160,575, Cl. 339-103.00M.
Schrecongost, Ray B., to Marmon Company. Touch responsive keying unit for electronic musical instruments. 4,160,400, Cl. 84-1.130.
Schulze, Ehrhart: *See*—
Matzner, Peter; and Schulze, Ehrhart, 4,160,396, Cl. 83-100.000.
Schwartz, Louis A. Music signal conversion apparatus. 4,160,402, Cl. 84-1.240.
Schwartz, Robert. Intraoral fluoroscope. 4,160,997, Cl. 358-93.000.
Schwartz, Robert W.: *See*—
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Schwesinger, Dennis W.: *See*—
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SCM Corporation: *See*—
Ehmann, William J., 4,160,786, Cl. 260-586.00P.
Scott, Gerald L.: *See*—
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Scott, Ian J. C.: *See*—
Dunne, Carroll J., Jr.; and Scott, Ian J. C., 4,160,380, Cl. 73-229.000.
Scribner, Albert W. Double stroke feeder. 4,160,518, Cl. 226-115.000.
Scriminger, William F.; and Ricketts, William H., to Muskogee Environmental Conservation Co. Apparatus to dispose of fly ash. 4,160,632, Cl. 425-62.000.
Scrimshaw, Martin R., to Bredero Price, B.V. Method and apparatus for measuring pipe coating thickness. 4,160,329, Cl. 33-178.00D.
Scuka, Victor: *See*—
Lundberg, Bo E. O.; and Scuka, Victor, 4,160,872, Cl. 174-101.500.
Seader, Junior D.; and Jayakar, Kirshnakumar M., to University of Utah. Process and apparatus to produce synthetic crude oil from tar sands. 4,160,720, Cl. 208-11.00R.
Seastrand, Kurt L., Jr., to Bell Telephone Laboratories, Incorporated. Space diversity receiver with combined step and continuous phase control. 4,160,952, Cl. 325-369.000.
Seesselberg, Henry A.: *See*—
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Sekiguchi, Tetsuo: *See*—
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Seleznev, Jury E.; Burkin, Jury A.; and Kuzmin, Sergei V., to Vychislitelny Tsentr Sibirskogo Otdelenia Akademii Nauk SSSR. Ferrite core memory. 4,161,037, Cl. 365-51.000.
Sendov, Stoyan H.; Evtimov, Stoyan I.; Nikolov, van A.; Kuklin, Ivan A.; Mirchev, Mircho G.; and Dimov, NikolasS., to Chimkombinat. Continuous operation extractor. 4,160,647, Cl. 422-106.000.
Sensibar, Ezra, to David Sensibar Irrevocable Trust. Liquid agitator for hopper. 4,160,618, Cl. 414-142.000.
Sergeant, Ronald G., to AMP Incorporated. Applicator tool with multiple chamber magazine. 4,160,317, Cl. 29-749.000.

Severson, Larry A., to Applied Power, Inc. Tire spreading and inspecting machine. 4,160,537, Cl. 254-50.300.

Seward, Thomas P., III: *See—*
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Seynaeve, Laurent: *See—*
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Sharp Kabushiki Kaisha: *See—*
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Shefsiek, Paul K.: *See—*
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Shell Oil Company: *See—*
Dickson, Leon L., Jr.; and Denison, Early B., 4,160,457, Cl. 134-167.00C.

Shenoy, Raghuram D.; and Ganapathy, Ananthram, to Cadbury India Limited. Process of degumming fatty glycerides using sodium acetate and acetic acid buffer. 4,160,774, Cl. 260-424.000.

Shibagaki, Masahiro; Horiike, Yasuhiro; and Yamazaki, Takashi, to Tokyo Shibaura Electric Co., Ltd. Gas etching method and apparatus. 4,160,690, Cl. 156-643.000.

Shibatani, Takeji: *See—*
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibatani, Takeji; and Nishimura, Noriyuki, 4,160,697, Cl. 435-194.000.

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Shimano Industrial Company Limited: *See—*
Fukui, Seiji, 4,160,393, Cl. 74-750.00B.

Shinada, Shinichi: *See—*
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Shinagawa, Mitsuhisa: *See—*
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Shinko Electric Co., Ltd.: *See—*
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,160,901, Cl. 235-437.000.

Shinohara, Toshio: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,160,699, Cl. 435-287.000.

Shionogi & Co., Ltd.: *See—*
Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, 4,160,784, Cl. 260-570.0AB.

Shirose, Toshihiro: *See—*
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Shoenfeld, Norman A.: *See—*
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Shugart Associates: *See—*
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Siderurgiemaritime-Maritime Staalnijverheid: *See—*
Josis, Christian; and Hans, Andre, 4,160,725, Cl. 210-21.000.

Siemens Aktiengesellschaft: *See—*
Hirschmann, Peter; and Hoefer, Ernst, 4,160,878, Cl. 179-18.0BC.
Kobler, Ulrich; and Tamm, Horst, 4,160,965, Cl. 335-79.000.
Ollinger, Max, 4,160,874, Cl. 178-69.00G.
Rossler, Bernward, 4,161,039, Cl. 365-185.000.

SIG Schweizerische Industrie-Gesellschaft: *See—*
Altermatt, Willy, 4,160,689, Cl. 156-583.100.

Sigmund, Richard W., to Timbern, Ltd. Log shearing and splitting device. 4,160,470, Cl. 144-3.00B.

Signetics Corporation: *See—*
Russell, Lewis K., 4,160,988, Cl. 357-44.000.

Sikes, Dennis. Antibody-active protein composition. 4,160,825, Cl. 424-85.000.

Silberberg, Joseph: *See—*
Kraft, Paul; and Silberberg, Joseph, 4,160,793, Cl. 525-230.000.

Simon-Krause, Inc.: *See—*
Johnston, Roger L., 4,160,492, Cl. 182-2.000.

Simpson, John P. Tennis serve training and practice device. 4,160,549, Cl. 273-29.00A.

Singer Company, The: *See—*
Barber, Warren A.; and Seesselberg, Henry A., 4,160,422, Cl. 112-121.110.
Stavis, Gus, 4,160,974, Cl. 343-16.00M.

Sinner, Michael: *See—*
Dietrichs, Hans-Hermann; Sinner, Michael; Opderbek, Fritz; and Brachthauser, Karl-Heinz, 4,160,695, Cl. 435-101.000.

Sipos, Tibor, to Johnson & Johnson. Treatment for gingivitis. 4,160,821, Cl. 424-49.000.

Sirianni, Guy V.: *See—*
Brigham, Robert J.; Sirianni, Guy V.; and Garner, Andrew, 4,160,661, Cl. 75-12.000.

Sisson, Keith T.: *See—*
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Sleder, Richard L., to Brunswick Corporation. Alternator driven CD ignition with auxiliary power. 4,160,435, Cl. 123-148.0CC.

Smakman, Robert: *See—*
Pannekeet, Wilhelmus; and Smakman, Robert, 4,160,675, Cl. 127-46.00A.

Smith, David S.; and McGregor, Adrienne R., to Technicon Instruments Corporation. Fluorimetric immunoassay for diphenylhydantoin. 4,160,818, Cl. 424-8.000.

Smith, Gordon S.; and Comstock, Theodore R., to IMC Magnetics Corp. Hold-open accessory for a door closer. 4,160,304, Cl. 16-49.000.

Smith, Harvell M.: *See—*
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Smith, Jack R.: *See—*
Martens, Alan; Radkevich, Thomas J.; and Smith, Jack R., 4,160,362, Cl. 60-39.18B.

Smith, John A.: *See—*
Jones, Barry E.; and Smith, John A., 4,160,971, Cl. 340-152.00T.

Smith, Roland L., to Nu Watt, Inc. Water vehicle-actuated air compressor and system therefor. 4,160,624, Cl. 417-330.000.

SmithKline Corporation: *See—*
Weinstock, Joseph, 4,160,765, Cl. 260-239.0BB.

Smiths Industries Limited: *See—*
Luke, Douglas V., 4,160,600, Cl. 356-352.000.

Smolyanitsky, Boris N.: *See—*
Kostylev, Alexandr D.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Gurkov, Konstantin S.; and Klimashko, Vladimir V., 4,160,486, Cl. 173-135.000.

Smulders, Adrianus J., to Microtel B.V. Electret transducers: acoustically transparent backplate of sintered conductive spheres and a thin electret coating; meshlike diaphragm spacing screen overlays apertured electret backplate with screen junctions overlaying the apertures. 4,160,881, Cl. 179-111.00E.

Snyer, William H.; Williams, Ralph E.; and Wisotski, John, to Edgell, Thomas A.; and Tillinghast, Roberta K. Earth fracturing apparatus. 4,160,412, Cl. 102-20.000.

Sobin, Bernard: *See—*
Boomus, Mary; Sobin, Bernard; and Schweitzer, John, 4,160,700, Cl. 435-298.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Radici, Pierino; Bianchi, Gaudenzio; and Colombo, Paolo, 4,160,789, Cl. 525-411.000.

S.A. des Ets Francois Salomon & Fils: *See—*
Salomon, Georges P. J., 4,160,555, Cl. 280-612.000.

Societe Generale de Constructions Electriques et Mecaniques"Alsthom et Cie: *See—*
Warszawski, Bernard, 4,160,856, Cl. 429-14.000.

Soder, Alfons; and Perrey, Klaus, to Hoechst Aktiengesellschaft. Analgesic phosphinyl compounds and compositions. 4,160,828, Cl. 424-200.000.

Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, to Olympus Optical Co., Ltd. Drive system for automatic culture apparatus. 4,160,699, Cl. 435-287.000.

Sola Basic Industries, Inc.: *See—*
Novy, Russell F.; Scott, Gerald L.; and Zurfluh, Thomas O., 4,160,680, Cl. 148-16.500.

Solow, Joseph E. Automobile trunk lock guard. 4,160,368, Cl. 70-417.000.

Solvay & Cie.: *See—*
Tytgat, Daniel; and Degols, Albert, 4,160,948, Cl. 324-61.00P.

Sonex International Corp.: *See—*
Mendrala, James A., 4,160,994, Cl. 358-22.000.

Sonic Instruments, Inc.: *See—*
Gromlich, Roy J.; Brech, Kilian H., deceased; and Cist, John D., 4,160,385, Cl. 73-622.000.

Sony Corporation: *See—*
Ichiyanagi, Yutaka, 4,161,003, Cl. 360-99.000.
Ishikawa, Fumio; and Tsuda, Yukio, 4,160,964, Cl. 334-15.000.
Kanazawa, Kenichi; and Takahashi, Nobuyuki, 4,161,022, Cl. 363-88.000.
Saito, Isao, 4,161,002, Cl. 360-75.000.
Sakamoto, Hitoshi, 4,161,001, Cl. 360-10.000.

Sotarem S.A.: *See—*
Piat, Jean, 4,160,439, Cl. 125-16.00R.

Soutar, David, Jr.; Feffer, Philip C.; and Guenther, Lloyd M., to Chevron Research Company. Improvements in thermoplastic yarn rebound texturizing methods. 4,160,307, Cl. 28-220.000.

Southwest Research Institute: *See—*
Jackson, Jerry L.; Allen, Theodore L., Jr.; Flach, Wayne T.; Jolly, William D.; and Cerwin, Steve A., 4,160,386, Cl. 73-625.000.

Spaetgens, Theodore W. Tuned torsional vibration damper. 4,160,390, Cl. 74-574.000.

Spear, Phillip L., to Avery International Corporation. Magazine page labeling apparatus. 4,160,687, Cl. 156-444.000.

Spectrum X-ray Corporation: *See—*
Hogan, William J., 4,160,912, Cl. 250-468.000.

Spence-Bate, Harry A. H. Film handling apparatus. 4,160,545, Cl. 271-106.000.

Spencer, Gerald: *See—*
Strawson, Kenneth H.; and Spencer, Gerald, 4,160,633, Cl. 425-85.000.

Sperrazza, Joseph L., to Universal Technology, Inc. Optical gaging system. 4,160,599, Cl. 356-381.000.

Sperry Rand Corporation: *See—*
Nicolson, Alexander M., 4,160,970, Cl. 340-18.0LD.
Stark, Edward W., 4,161,034, Cl. 364-822.000.

Sprague Electric Company: *See*—
de Keyser, Andre; and Seynaeve, Laurent, 4,160,962, Cl. 333-141.000.
Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Photosensitive composition. 4,160,671, Cl. 96-91.00D.
Stambaugh, Robert L.; and Galluccio, Richard A., to Rohm and Haas Company. Polyolefinic copolymer additives for lubricants and fuels. 4,160,739, Cl. 252-34.000.
Stanley Electric Co., Ltd.: *See*—
Teshima, Toru; and Uchiyama, Yoshinori, 4,160,447, Cl. 128-735.000.
Stanwick, Tad. Pile anchor for moorings. 4,160,613, Cl. 405-244.000.
Stark, Edward W., to Sperry Rand Corporation. Correlation apparatus. 4,161,034, Cl. 364-822.000.
Staudinger, Frederick J.: *See*—
Montagnino, James G.; and Staudinger, Frederick J., 4,160,899, Cl. 235-101.000.
Stauffer Chemical Company: *See*—
Kraft, Paul; and Silberberg, Joseph, 4,160,793, Cl. 525-230.000.
Rodebush, James E.; and Thiele, Gerald H., 4,160,659, Cl. 71-95.000.
Stavis, Gus, to Singer Company, The. Target sensing and homing system. 4,160,974, Cl. 343-16.00M.
Steinbaugh, Gary: *See*—
Carvalho, Robert L.; Canfield, Sheldon A.; and Steinbaugh, Gary, 4,160,360, Cl. 57-81.000.
Steiner, William W.: *See*—
Montgomery, Murray M.; Gilger, William F.; and Steiner, William W., 4,160,617, Cl. 414-139.000.
Stelzer, Robert A.: *See*—
Blake, Nathan L.; and Stelzer, Robert A., 4,160,355, Cl. 56-98.000.
Stemer, Jacques: *See*—
Bouzard, Daniel; Weber, Abraham; and Stemer, Jacques, 4,160,863, Cl. 544-30.000.
Stemmler, Kurt; Langenbeck, Peter; and Ehlscheid, Gunter, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG. Method and apparatus for the focal form cutting of a moving web of material by a laser beam. 4,160,894, Cl. 219-121.00L.
Sterling Drug Inc.: *See*—
Zenitz, Bernard L., 4,160,862, Cl. 542-439.000.
Steudel, Fritz, to Raytheon Company. Correction circuit for wide bandwidth antenna. 4,160,975, Cl. 343-16.00M.
Stevens, Graham A. Air structure. 4,160,523, Cl. 237-1.00A.
Stewart, John K., to Canron, Inc. Tamping tool. 4,160,419, Cl. 104-10.000.
Stewart, Robert M.; and Schwartz, Robert W., to W. R. Grace & Co. Prill tower rake. 4,160,631, Cl. 425-10.000.
Stiber, Clifford W. Circulating fireplace with adjustable controls for selectively heating one or more rooms. 4,160,524, Cl. 237-51.000.
Stivender, Paul M.: *See*—
Daniels, Herbert E.; Stivender, Paul M.; Schanen, Paul C.; and King, Robert V., 4,160,906, Cl. 250-322.000.
Stockel, Dieter; and Oberg, Hans-Jurgen, to G. Rau. Electrical contact element and method of producing the same. 4,160,855, Cl. 428-621.000.
Stockman, Leon: *See*—
Stockman, Suzanne; and Stockman, Leon, 4,160,414, Cl. 102-65.200.
Stockman, Suzanne; and Stockman, Leon. Projectile having a delay-action firing mechanism. 4,160,414, Cl. 102-65.200.
Stone, Clement A., to Merck & Co., Inc. Antihypertensive compositions containing an arylsubstituted alanine and a phenyl hydrazinopropionic acid. 4,160,835, Cl. 424-263.000.
Strawson, Kenneth H.; and Spencer, Gerald, to National Research Development Corporation. Apparatus for moulding components in compactable materials. 4,160,633, Cl. 425-85.000.
Streck Laboratories, Inc.: *See*—
Ryan, Wayne L., 4,160,644, Cl. 23-230.00B.
Strunk, Richard J.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., to Uniroyal, Inc. Method for controlling insects with tetrasubstituted organotin compounds. 4,160,846, Cl. 424-288.000.
Stumpp, Walter: *See*—
Demuth, Hans; and Stumpp, Walter, 4,160,532, Cl. 242-125.100.
Stupp, Samuel I.: *See*—
Carr, Stephen H.; and Stupp, Samuel I., 4,160,760, Cl. 260-42.210.
Sudarev, Anatoly V.: *See*—
Maev, Vladimir A.; Kuznetsov, Andrei L.; Lamm, Jury A.; Ivakhnenko, Viktor V.; Sudarev, Anatoly V.; and Prokushenkov, Nikolai N., 4,160,640, Cl. 431-9.000.
Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, to Shionogi & Co., Ltd. Process for the production of o-aminophenyl ketone derivatives. 4,160,784, Cl. 260-570.0AB.
Sugimoto, Tetsuya: *See*—
Watanabe, Akira; Sugimoto, Tetsuya; and Makino, Yasuhiro, 4,160,744, Cl. 252-440.000.
Suhy, Frederick A.: *See*—
Thomas, Ronnie L.; and Suhy, Frederick A., 4,160,483, Cl. 166-307.000.
Sullivan, Paul F.: *See*—
Lynch, Francis deS.; Gobush, William; Sullivan, Paul F.; Moore, Randall W.; Haas, Steven L.; Fonteneau, Norman O.; and Jepson, John W., 4,160,942, Cl. 350-120.000.
Sullivan, Ronald L.; and Cosentino, Ronald R., to M E P & I Corporation. Telephone display accessory. 4,160,879, Cl. 179-90.0AN.
Sulzer Brothers, Ltd.: *See*—
Demuth, Hans; and Stumpp, Walter, 4,160,532, Cl. 242-125.100.
Roffler, Josua, 4,160,477, Cl. 165-172.000.
Sumitomo Electric Industries, Ltd.: *See*—
Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, 4,160,387, Cl. 73-639.000.
Sundberg, Yngve: *See*—
Marchner, Jan; and Sundberg, Yngve, 4,160,868, Cl. 13-11.000.
Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, to Nissan Motor Company, Limited. Automatic power transmission with direct-drive clvtch. 4,160,392, Cl. 74-732.000.
Sunstar Hamigaki Kabushiki Kaisha: *See*—
Hashimoto, Shigeru; and Inoue, Kenji, 4,160,822, Cl. 424-52.000.
Surgikos: *See*—
Badolato, Anthony; and Farrell, Joseph S., 4,160,801, Cl. 422-46.000.
Sussman, Milton H.: *See*—
Gottlieb, Nathan; and Sussman, Milton H., 4,160,578, Cl. 350-89.000.
Suzuki, Katsumi: *See*—
Inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyanishi, Toshiaki, 4,160,824, Cl. 424-84.000.
Suzuki, Kazuhiro: *See*—
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,160,901, Cl. 235-437.000.
Suzuki, Shigeyoshi: *See*—
Tsubai, Yasuo; Iguchi, Shigeru; Suzuki, Shigeyoshi; and Iwata, Tamotsu, 4,160,670, Cl. 96-119.00R.
Suzuki, Shosuke: *See*—
Matsumoto, Masayasu; Sakamoto, Susumu; Matsudaira, Nobufumi; Iida, Kazuyoshi; Kondo, Yoshikazu; Kondo, Kazuo; Watanabe, Haruo; Suzuki, Shosuke; and Onizaki, Yasushi, 4,160,491, Cl. 181-284.000.
Suzuki, Takanobu: *See*—
Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, 4,160,387, Cl. 73-639.000.
Suzuki, Toyotoshi; and Matsuzaki, Kazunari, to Canon Kabushiki Kaisha. Camera having an electrically timed shutter. 4,160,591, Cl. 354-235.000.
Suzuki, Yoshikatsu: *See*—
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
Svensson, Karl-Erik: *See*—
Nordblad, Sven S.; and Svensson, Karl-Erik, 4,160,527, Cl. 242-47.000.
Swanson, Rollan. De-sulfurization of petroleum residues using melt of alkali metal sulfide hydrates or hydroxide hydrates. 4,160,721, Cl. 208-230.000.
Sweeney, William M., to Texaco Inc. Low pour crude oil compositions. 4,160,459, Cl. 137-13.000.
Sweet, Forest H., III, to Dow Chemical Company, The. Inhibited aqueous, methoxypropanol coolant adjusted to a pH between about 6 and 9. 4,160,740, Cl. 252-75.000.
Swiss Aluminium Ltd.: *See*—
Merz, Walter, 4,160,567, Cl. 406-98.000.
Switzer, Ralph V. Freight car door opener. 4,160,509, Cl. 414-607.000.
Symot Limited: *See*—
Willis, Gordon, 4,160,334, Cl. 40-531.000.
Systron-Donner Corporation: *See*—
Marquess, Richard D., 4,160,568, Cl. 308-159.000.
Syva Company: *See*—
Ullman, Edwin F., 4,160,645, Cl. 23-230.00B.
Szczepanski, Henry, to Ciba-Geigy Corporation. Novel amidines. 4,160,843, Cl. 424-278.000.
Takagi, Kinzo. Variable delivery hydraulic equipment. 4,160,403, Cl. 91-483.000.
Takahashi, Nobuyuki: *See*—
Kanazawa, Kenichi; and Takahashi, Nobuyuki, 4,161,022, Cl. 363-88.000.
Takahashi, Sankichi: *See*—
Matsuzaki, Harumi; Takahashi, Sankichi; and Kuroda, Osamu, 4,160,713, Cl. 204-180.00P.
Takeda Chemical Industries, Ltd.: *See*—
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; and Minami, Isao, 4,160,830, Cl. 424-246.000.
Takei, Kenji: *See*—
Nakayama, Toshihiko; and Takei, Kenji, 4,160,928, Cl. 310-353.000.
Tamburasev, Zrinka: *See*—
Cakara, Marica; Djokic, Slobodan; and Tamburasev, Zrinka, 4,160,783, Cl. 260-556.0AR.
Tamm, Horst: *See*—
Kobler, Ulrich; and Tamm, Horst, 4,160,965, Cl. 335-79.000.
Tan, Marshall: *See*—
Choe, Eui W.; Tan, Marshall; and Mininni, Robert M., 4,160,755, Cl. 260-29.60H.
Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Kakimoto, Toshio; Kakie, Yoshiaki; Shibatani, Takeji; and Nishimura, Noriyuki, 4,160,697, Cl. 435-194.000.
Tanaka, Hideaki: *See*—
Miyairi, Sachio; Tanaka, Hideaki; Yabe, Akira; and Honda, Koichi, 4,160,698, Cl. 435-173.000.
Tanaka Instrument Company Limited: *See*—
Kubono, Takashi, 4,160,389, Cl. 74-89.180.
Tanaka, Kazuo, to West Electric Company, Ltd. Accidental flash prevention in a photographic flash device. 4,160,933, Cl. 315-241.00P.

Tanaka, Shoji: *See*—
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
Tandon Magnetics Corporation: *See*—
Tandon, Sirjang L.; and Moon, John P., 4,160,315, Cl. 29-603.000.
Tandon, Sirjang L.; and Moon, John P., to Tandon Magnetics Corporation. Method of making a magnetic head assembly. 4,160,315, Cl. 29-603.000.
Tanno, Shogo; and Hirose, Masateru, to Dainichi-Nippon Cables, Ltd. Apparatus and method for electrically testing multi-core cable. 4,160,947, Cl. 324-54.000.
Tanuma, Itsuo: *See*—
Honda, Toshio; Fukuura, Yukio; Tanaka, Shoji; Tanuma, Itsuo; Suzuki, Yoshikatsu; and Ishikawa, Hikaru, 4,160,757, Cl. 260-31.20N.
Tatsumi, Toshio: *See*—
Inaba, Hideya; Tatsumi, Toshio; and Iwai, Chihiro, 4,160,805, Cl. 422-180.000.
Taupin, Jean-Paul. Device for fluidizing and discharging divided material. 4,160,514, Cl. 222-228.000.
Tawara, Ikuo: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,160,699, Cl. 435-287.000.
Taylor, Lauren P.; and Petroski, Alex, to LRS Research Limited. Catch basin processing apparatus. 4,160,734, Cl. 210-96.100.
Taylor, Paul D., to Celanese Corporation. Synthesis of tetrahydrofuran. 4,160,771, Cl. 260-346.110.
Taylor, Richard E. Collapsible refuse bag cart. 4,160,557, Cl. 280-652.000.
TDK Electronics Co., Ltd.: *See*—
Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.
TEAC Corporation: *See*—
Haraguchi, Tamotsu, 4,161,007, Cl. 360-137.000.
Technicon Instruments Corporation: *See*—
de Jong, Eduard B. M., 4,161,030, Cl. 364-581.000.
Smith, David S.; and McGregor, Adrienne R., 4,160,818, Cl. 424-8.000.
Telefonaktiebolaget L M Ericsson: *See*—
Lundberg, Bo E. O.; and Scuka, Victor, 4,160,872, Cl. 174-101.500.
Nordblad, Sven S.; and Svensson, Karl-Erik, 4,160,527, Cl. 242-47.000.
Thyselius, Per-Olov, 4,160,951, Cl. 325-13.000.
Teratani, Hironaga: *See*—
Fujita, Toshio; and Teratani, Hironaga, 4,160,673, Cl. 106-45.000.
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V. Nickel-base alloy. 4,160,665, Cl. 75-171.000.
Teshima, Toru; and Uchiyama, Yoshinori, to Stanley Electric Co., Ltd. Device for detecting particular point of human body. 4,160,447, Cl. 128-735.000.
Texaco Inc.: *See*—
Schievelbein, Vernon H.; and Park, Jack H., 4,160,480, Cl. 166-269.000.
Sweeney, William M., 4,160,459, Cl. 137-13.000.
Texas Eastern Engineering, Ltd.: *See*—
Martin, Robert E.; and Hagan, Ernest P., Jr., 4,160,652, Cl. 55-46.000.
Texas Instruments Incorporated: *See*—
Hays, Ronald M., Jr., 4,160,963, Cl. 333-151.000.
Manns, William G., 4,160,310, Cl. 29-25.140.
Texasgulf Inc.: *See*—
Conroy, Edward H.; and Gloster, Arthur, 4,160,812, Cl. 423-421.000.
Theeuwes, Felix, to Alza Corporation. Osmotic system having laminated wall comprising semipermeable lamina and microporous lamina. 4,160,452, Cl. 128-260.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for continuous track renewal. 4,160,418, Cl. 104-2.000.
Thiele, Gerald H.: *See*—
Rodebush, James E.; and Thiele, Gerald H., 4,160,659, Cl. 71-95.000.
Thoma, Wilhelm: *See*—
Niederdellmann, Georg; Quiring, Bernd; and Thoma, Wilhelm, 4,160,686, Cl. 156-331.000.
Thomas, Ronnie L.; and Suhy, Frederick A., to Dow Chemical Company, The. Method of treating a well using fluoboric acid to clean a propped fracture. 4,160,483, Cl. 166-307.000.
Thomson-CSF: *See*—
Roche, Marcel, 4,160,683, Cl. 148-187.000.
Thorington, Luke; Walsh, Peter; Koo, Ronald; and Thouret, Wolfgang, to Duro-Test Corporation. Incandescent light source with transparent heat mirror. 4,160,929, Cl. 313-112.000.
Thornton, Alfred K.; and Cerone, Frank E., to Union Carbide Corporation. Rechargeable 99MO/99MTC generator system. 4,160,910, Cl. 250-432.0PD.
Thouret, Wolfgang: *See*—
Thorington, Luke; Walsh, Peter; Koo, Ronald; and Thouret, Wolfgang, 4,160,929, Cl. 313-112.000.
Thyselius, Per-Olov, to Telefonaktiebolaget L M Ericsson. Method of regenerating asynchronous data signals and apparatus for performing the method. 4,160,951, Cl. 325-13.000.
Tiberg, Ernst B.: *See*—
Lindahl, Jonas A. I.; Tiberg, Ernst B.; and Haggstrom, Sten L., 4,160,693, Cl. 162-24.000.
Tiemann, Helmut: *See*—
Scholl, Hans; and Tiemann, Helmut, 4,160,423, Cl. 112-121.120.
Tillinghast, Roberta K.: *See*—
Snyer, William H.; Williams, Ralph E.; and Wisotski, John, 4,160,412, Cl. 102-20.000.
Timbern, Ltd.: *See*—
Sigmund, Richard W., 4,160,470, Cl. 144-3.00B.
Togami, Paul G.: *See*—
Hawkins, Robert W.; Togami, Paul G.; and Drayer, T. Gary, 4,160,456, Cl. 130-27.00T.
Tognazzini, Jere W.; and Humphreys, Kenneth R. Electrical terminal block. 4,160,889, Cl. 200-163.000.
Tokura, Nobufumi: *See*—
Nakanishi, Sadao; Suzuki, Kazuhiro; Tokura, Nobufumi; and Endo, Shinichiro, 4,160,901, Cl. 235-437.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Shibagaki, Masahiro; Horiike, Yasuhiro; and Yamazaki, Takashi, 4,160,690, Cl. 156-643.000.
Tomioka, Michiaki, to Chushin Gakki Seizo Kabushiki Kaisha. String vibration transducer bridge for electric stringed instruments. 4,160,401, Cl. 84-1.160.
Tonoike, Kiyoshi: *See*—
Nishida, Takao; and Tonoike, Kiyoshi, 4,160,756, Cl. 260-29.60M.
Toor, Yair; Rouso, Haim; and Kopilavitz, Ben-Zion, to Israel Electro-Optical Industry Ltd. Circuitry for displaying a constantly changing M-mode output on a raster scan display. 4,161,035, Cl. 364-900.000.
Topilin, Valentin V.: *See*—
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.
Torterotot, Roland M.; and Nasica, Jean R. L. Production of sterile packages. 4,160,852, Cl. 428-192.000.
Touba, Ali R.: *See*—
Hallstrom, Curtis H.; Touba, Ali R.; Glass, Brian E.; Luck, John V.; and Daravingas, George V., 4,160,850, Cl. 426-601.000.
Towle, Leo B.: *See*—
Akiyama, Robert H.; and Towle, Leo B., 4,160,752, Cl. 260-27.0BB.
Towmotor Corporation: *See*—
Gregg, Edmund; and Pilarczyk, Charles E., 4,160,735, Cl. 210-130.000.
Toyo Denki Seizo Kabushiki Kaisha: *See*—
Ishikawa, Fujio, 4,160,925, Cl. 310-160.000.
Toyo Kogyo Company Limited: *See*—
Kubono, Takashi, 4,160,389, Cl. 74-89.180.
Toyoda-Koki Kabushiki-Kaisha: *See*—
Fujita, Michio, 4,160,438, Cl. 125-11.0TP.
Toyoda, Tatsuo: *See*—
Sugasawa, Tsutomu; Toyoda, Tatsuo; Adachi, Makoto; and Sasakura, Kazuyuki, 4,160,784, Cl. 260-570.0AB.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Furukubo, Tatsumi, 4,160,363, Cl. 60-290.000.
Tracy, Ronald J. Portable dental cabinet. 4,160,323, Cl. 32-22.000.
TRW Inc.: *See*—
Neff, Joseph A.; and English, William D., 4,160,811, Cl. 423-276.000.
van Buren, Harold S., Jr., 4,160,887, Cl. 200-61.620.
Tsentrainy Nauchno-Issiedovatelsky Dizeiny Institut: *See*—
Petrov, Alexandr P.; Kovalevsky, Evgeny S.; Kosyak, Anatoly F.; and Bondarev, German G., 4,160,365, Cl. 60-606.000.
Tsubai, Yasuo; Iguchi, Shigeru; Suzuki, Shigeyoshi; and Iwata, Tamotsu, to Mitsubishi Paper Mills, Ltd. Lithographic printing plate material. 4,160,670, Cl. 96-119.00R.
Tsuchiya, Shigekatsu: *See*—
inazuka, Shinichi; Tsuchiya, Shigekatsu; Suzuki, Katsumi; and Miyanishi, Toshiaki, 4,160,824, Cl. 424-84.000.
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Wilbs, Thomas. Warm water heater. 4,160,475, Cl. 165-55.000.
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Wilhite, John E., to Honeywell Information Systems Inc. Hardware controlled transfers to microprogram control apparatus and return via microinstruction restart codes. 4,161,026, Cl. 364-200.000.
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Wilkinson, Stanley B., to General Electric Company. Ground distance relay employing phase comparator measurement. 4,161,011, Cl. 361-80.000.
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Willis, Gordon, to Symot Limited. Reversible page turner. 4,160,334, Cl. 40-531.000.
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Winblad, Michael E. Drill containing minimum cutting material. 4,160,616, Cl. 408-144.000.
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Wright, Duane H., deceased; and Meyer, Stephen F., 4,160,886, Cl. 200-5.00A.
Wrublewski, Thomas A.: *See*—
Nardella, Paul C.; Feeney, Joseph D.; Wrublewski, Thomas A.; and Gonsalves, Anthony W., 4,160,857, Cl. 429-97.000.
Wu, Che-Kuang: *See*—
Bartholomew, Roger F.; Mach, Joseph F.; and Wu, Che-Kuang, 4,160,654, Cl. 65-30.00E.
Wu, Shu-Yau, to Westinghouse Electric Corp. Complementary metal-ferroelectric semiconductor transistor structure and a matrix of such transistor structure for performing a comparison. 4,161,038, Cl. 365-145.000.
Wu, Tai-Wing, to Eastman Kodak Company. Ascorbic acid determination. 4,160,696, Cl. 435-25.000.
Wynn, Barry, to General Signal Corporation. Gear pumps with low pressure shaft lubrication. 4,160,630, Cl. 418-102.000.
Wynn, William H., to Monitek, Inc. Apparatus for measuring of particulate scattering in fluids. 4,160,914, Cl. 250-574.000.
Xerox Corporation: *See*—
Barton, Peter; and Lamb, Philip W. J., 4,160,547, Cl. 271-275.000.
Damouth, David E.; and Gunning, William F., 4,160,939, Cl. 318-723.000.
Yabe, Akira: *See*—
Miyairi, Sachio; Tanaka, Hideaki; Yabe, Akira; and Honda, Koichi, 4,160,698, Cl. 435-173.000.
Yagi, Shizuo; Kogure, Hiroshi; and Matsuoka, Saburo, to Honda Giken Kogyo Kabushiki Kaisha. Insert liner for divided auxiliary combustion chamber of engine. 4,160,431, Cl. 123-75.00B.
Yamada, Shigeru; and Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,160,404, Cl. 84-1.260.
Yamamori, Takahiro: *See*—
Sunohara, Yoshio; Ohtsuka, Kunio; Ishimaru, Wataru; Yamamori, Takahiro; and Shibuya, Toshio, 4,160,392, Cl. 74-732.000.
Yamamoto, Takashi: *See*—
Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.
Yamashita, Yoshinari: *See*—
Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, 4,160,748, Cl. 252-518.000.
Yamazaki, Hiroyuki: *See*—
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Yamazaki, Takashi: *See*—
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Yano, Akifumi: *See*—
Nagasaki, Katsumi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; Yano, Akifumi; and Momose, Tetsuo, 4,160,662, Cl. 75-24.000.
Yasuo, Sasaki, to Displaytek Corporation; and Daiwa Shinku Corporation. Electrostatic display assembly. 4,160,582, Cl. 350-269.000.
Yates, David J. C.: *See*—
Murrell, Lawrence L.; and Yates, David J. C., 4,160,745, Cl. 252-466.00J.
Yau, Wallace W.: *See*—
Kirkland, Joseph J.; and Yau, Wallace W., 4,160,728, Cl. 210-31.00C.
Yockey, Francis J.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,161,031, Cl. 364-709.000.
Yodogawa, Masatada; Miyabayashi, Susumu; Yamashita, Yoshinari; Yamamoto, Takashi; Hayashi, Kohji; and Ueoka, Hisayoshi, to TDK Electronics Co., Ltd. Non-linear resistor. 4,160,748, Cl. 252-518.000.
Yoerger, William E.: *See*—
McCabe, John M.; and Yoerger, William E., 4,160,666, Cl. 96-1.0PC.
Yoshimoto, Hiroyuki: *See*—
Ihara, Susumu; Yoshimoto, Hiroyuki; Mizuuchi, Katsumi; Nishiumi, Hideo; and Suzuki, Takanobu, 4,160,387, Cl. 73-639.000.
Yoshinaga, Makoto: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,160,699, Cl. 435-287.000.
Yoshioka, Yoshio: *See*—
Natsui, Ken-ichi; Hirasawa, Kunio; Yoshioka, Yoshio; and Chida, Hiroshi, 4,160,888, Cl. 200-148.00A.
Youde, D.: *See*—
Austin-Brown, P.; Youde, D.; and Pond, R. F., 4,160,610, Cl. 403-407.000.
Young, Bruce, Jr. Shelf-supporting standards. 4,160,506, Cl. 211-86.000.
Young, Lewis B., to Mobil Oil Corporation. Disproportionation of toluene. 4,160,788, Cl. 585-475.000.
Yust, Paul R.: *See*—
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,160,819, Cl. 424-45.000.
Zahir, Abdul-Cader: *See*—
Renner, Alfred; and Zahir, Abdul-Cader, 4,160,859, Cl. 528-322.000.
Zajac, Ronald E.: *See*—
Kotzur, Frank W.; and Zajac, Ronald E., 4,160,533, Cl. 242-137.100.
Zant, Fred: *See*—
Lyons, Paul; Zant, Fred; and Resnick, Charles, 4,160,338, Cl. 46-44.000.
Zasetsky, Petr A.: *See*—
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.
Zbryski, William P.: *See*—
Lukac, Frederick S.; and Zbryski, William P., 4,160,677, Cl. 134-9.000.
Zeh, Horst: *See*—
Finsterwalder, Lorenz; Zeh, Horst; and Schaarschmidt, Ulrich, 4,160,382, Cl. 73-422.00R.
Zenith Radio Corporation: *See*—
Merrell, Richard G., 4,160,993, Cl. 358-21.00V.
Zenitz, Bernard L., to Sterling Drug Inc. 1-Acyl-3-(amino-lower-alkyl-)indoles. 4,160,862, Cl. 542-439.000.
Zhuchin, Vladimir N.: *See*—
Terekhov, Kuzma I.; Tumanov, Alexei T.; Markina, Ljudmila S.; Okolelova, Klavdia A.; Belov, Alexandr F.; Bobovnikov, Nikolai D.; Tulyankin, Fedor V.; Zasetsky, Petr A.; Zhuchin, Vladimir N.; Dzugutov, Mikhail Y.; Podolsky, Mikhail S.; and Topilin, Valentin V., 4,160,665, Cl. 75-171.000.
Zimmermann, Detlef; Demircioglu, Sayman F.; and Kugler, Jindrich, to Northern Telecom Limited. Protection circuitry for cable transmission system. 4,161,008, Cl. 361-56.000.
Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,160,940, Cl. 318-803.000.
Zuber, Werner: *See*—
Chard, Gerald L. P.; Haupt, Joachim; and Zuber, Werner, 4,160,890, Cl. 200-308.000.
Zurfluh, Thomas O.: *See*—
Novy, Russell F.; Scott, Gerald L.; and Zurfluh, Thomas O., 4,160,680, Cl. 148-16.500.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JULY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Donaldson Company, Inc.: *See—*
Hiemstra, John R.; and Wagner, Wayne M., Re. 30,042, Cl. 285-419.000.

Hiemstra, John R.; and Wagner, Wayne M., to Donaldson Company, Inc. Exhaust system connector seal. Re. 30,042, Cl. 285-419.000.

Wagner, Wayne M.: *See—*
Hiemstra, John R.; and Wagner, Wayne M., Re. 30,042, Cl. 285-419.000.

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Reedley Nursery, Inc. Nectarine tree (43-G-587). 4,435, 7-10-79, Cl. 41.000.

Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA": *See—*
Holtkamp, Reinhold, 4,433, Cl. 69.000.

Holtkamp, Reinhold, to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA". African violet plant. 4,433, 7-10-79, Cl. 69.000.

Hrebeniuk, Alexander. Poinsettia plant. 4,434, 7-10-79, Cl. 86.000.

Marionnet, Andre, to Marionnet-Rabier, Jeanne. Strawberry plant. 4,432, 7-10-79, Cl. 49.000.

Marionnet-Rabier, Jeanne: *See—*
Marionnet, Andre, 4,432, Cl. 49.000.

Nies, Marvin L. Cherry tree. 4,436, 7-10-79, Cl. 37.000.

Reedley Nursery, Inc.: *See—*
Anderson, Frederic W., 4,435, Cl. 41.000.

LIST OF DESIGN PATENTEES

Abrasives International, Limited: *See—*
Ashworth, Stewart I., 252,349, Cl. D15-124.000.

Ackeret, Peter, to Zyliss Zysset AG. Fruit holder. 252,312, 7-10-79, Cl. D7-99.000.

Alegria, Richard S. Shoe protector or similar article. 252,296, 7-10-79, Cl. D2-277.000.

American Home Products Corporation: *See—*
Brady, Joseph E., 252,342, Cl. D24-31.000.

Amerock Corporation: *See—*
Claytoa, LaVerne E., 252,317, Cl. D8-350.000.
Waters, Phillip A., 252,305, Cl. D6-181.000.

AMF Incorporated: *See—*
Landry, Thomas J., 252,313, Cl. D7-130.000.

Ashworth, Stewart I., to Abrasives International, Limited. Abrading machine cabinet. 252,349, 7-10-79, Cl. D15-124.000.

Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., to Bell Telephone Laboratories, Incorporated. Telephone stand. 252,331, 7-10-79, Cl. D14-60.000.

Bassinger, Frederick W., to K-tel International, Inc. Toy mold. 252,345, 7-10-79, Cl. D21-120.000.

Baudon, Maurice C., to S.A. Ets Lardenois. Combined brush handle and back. 252,298, 7-10-79, Cl. D4-35.000.

Bell Telephone Laboratories, Incorporated: *See—*
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., 252,331, Cl. D14-60.000.

Brady, Joseph E., to American Home Products Corporation. Tamper proof tray for hypodermic syringes. 252,342, 7-10-79, Cl. D24-31.000.

BSR Limited: *See—*
Leech, Leslie A., 252,330, Cl. D14-17.000.

Cagle, Donald D. Combined fireplace grate and heater. 252,316, 7-10-79, Cl. D7-207.000.

Cameron, Carl A., to Chrysler Corporation. Pair of automobile headlamp lenses. 252,352, 7-10-79, Cl. D48-32.00A.

Chojna, Harry. Vehicle speedometer metric conversion label design. 252,320, 7-10-79, Cl. D10-103.000.

Chojna, Harry. Vehicle speedometer metric conversion label. 252,321, 7-10-79, Cl. D10-103.000.

Chrysler Corporation: *See—*
Cameron, Carl A., 252,352, Cl. D48-32.00A.

Clayton, LaVerne E., to Amerock Corporation. Escutcheon. 252,317, 7-10-79, Cl. D8-350.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 252,348, Cl. D21-134.000.

Comercial Exportadora Banolense S.A.: *See—*
Vinas, Lorenzo C., 252,297, Cl. D2-300.000.

Current, Wayne A. Sewing machine work table or similar article. 252,304, 7-10-79, Cl. D6-179.000.

Dart Container Corporation: *See—*
Dart, William A., 252,315, Cl. D7-138.000.

Dart, William A., to Dart Container Corporation. Knife. 252,315, 7-10-79, Cl. D7-138.000.

Denhoff, Myron L. Combined display rack and selection console. 252,306, 7-10-79, Cl. D6-188.000.

Dunlop Limited: *See—*
Gill, Barrington S.; and Hart, Claude A., 252,326, Cl. D12-141.000.
Shirashoji, Hisashi, 252,327, Cl. D12-142.000.

Educational Calculator Devices, Inc.: *See—*
McCarty, George S., 252,301, Cl. D6-155.000.

Engstrom, John G.: *See—*
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., 252,331, Cl. D14-60.000.

Flambeau Products Corporation: *See—*
Uyeda, Tim M., 252,354, Cl. D3-30.000.

Freedman Artcraft Engineering Corp.: *See—*
Hosmer, Max E., 252,307, Cl. D6-191.000.

Funahashi, Takaji. Felt tip pen. 252,333, 7-10-79, Cl. D19-47.000.

Genaro, Donald M.: *See—*
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., 252,331, Cl. D14-60.000.

Gill, Barrington S.; and Hart, Claude A., to Dunlop Limited. Tire. 252,326, 7-10-79, Cl. D12-141.000.

Glassman, Fredrick G. Light fixture. 252,351, 7-10-79, Cl. D48-23.00R.

Glassman, Fredrick R. Light fixture. 252,350, 7-10-79, Cl. D48-3.000.

Goldpaint, Leon. Toy ship. 252,335, 7-10-79, Cl. D21-130.000.

Grippi, Vincent, Jr. Fish hook and leader holder. 252,336, 7-10-79, Cl. D22-23.000.

Hart, Claude A.: *See—*
Gill, Barrington S.; and Hart, Claude A., 252,326, Cl. D12-141.000.

Hawkins, Larry D.: *See—*
Parker, William E.; Parker, William E., Jr.; and Hawkins, Larry D., 252,344, Cl. D21-22.000.

Hehnen, James M. Chlorinator for swimming pools. 252,337, 7-10-79, Cl. D23-3.000.

Hori, Makoto; and Nakano, Hiroshi. Motorcycle. 252,325, 7-10-79, Cl. D12-110.000.

Hosmer, Max E., to Freedman Artcraft Engineering Corp. Drawer suspension frame. 252,307, 7-10-79, Cl. D6-191.000.

Ilich, John. Game board. 252,343, 7-10-79, Cl. D21-30.000.

Ishii, Yoshiyasu: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 252,348, Cl. D21-134.000.

Item House, Inc.: *See—*
Persky, Warren E., 252,302, Cl. D6-157.000.
Persky, Warren E., 252,303, Cl. D6-157.000.

John, Julius F., to Norco Industries, Inc. Stabilizer jack. 252,324, 7-10-79, Cl. D12-55.000.

Johnson, Russell C. Finger ring. 252,322, 7-10-79, Cl. D11-31.000.
Jonsson, Nils G., to National Service Industries, Inc. Circuit connector module. 252,329, 7-10-79, Cl. D13-24.000.
K-tel International, Inc.: *See*—
Bassinger, Frederick W., 252,345, Cl. D21-120.000.
Kopel, Paul S. Clock. 252,319, 7-10-79, Cl. D10-25.000.
Kriegner, George W. Golf cart carried open umbrella holder. 252,318, 7-10-79, Cl. D8-373.000.
Landry, Thomas J., to AMF Incorporated. Heat storage base for dinnerware. 252,313, 7-10-79, Cl. D7-130.000.
Leech, Leslie A., to BSR Limited. Record player. 252,330, 7-10-79, Cl. D14-17.000.
Ludwig Industries: *See*—
Mikosz, Daniel S., 252,353, Cl. D17-22.000.
Marshall, Simeon, to Rachengold-Werk Adolf Speck. Display rack. 252,299, 7-10-79, Cl. D6-23.000.
Matsuda, Hiroaki: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 252,348, Cl. D21-134.000.
McCarty, George S., to Educational Calculator Devices, Inc. Combined lectern and display calculator. 252,301, 7-10-79, Cl. D6-155.000.
McGarvey, John N.: *See*—
Baase, Andrew J.; Engstrom, John G.; Genaro, Donald M.; and McGarvey, John N., 252,331, Cl. D14-60.000.
Mikosz, Daniel S., to Ludwig Industries. Drum lug. 252,353, 7-10-79, Cl. D17-22.000.
Miramar of California: *See*—
Schwartz, Michel, 252,309, Cl. D7-3.000.
Molenaar, Lester V. Key chain fob. 252,323, 7-10-79, Cl. D11-81.000.
Moneta S.p.A.: *See*—
Prussi, Graziano, 252,311, Cl. D7-97.000.
Moore, James T., Sr. Combined motorcycle gas tank, radio and tape deck. 252,328, 7-10-79, Cl. D12-155.000.
Nakano, Hiroshi: *See*—
Hori, Makoto; and Nakano, Hiroshi, 252,325, Cl. D12-110.000.
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Combined toy vehicle and removable figures therefor. 252,348, 7-10-79, Cl. D21-134.000.
National Service Industries, Inc.: *See*—
Jonsson, Nils G., 252,329, Cl. D13-24.000.
National Union Electric Corporation: *See*—
Schaefer, Harold W., 252,332, Cl. D15-53.000.
Norco Industries, Inc.: *See*—
John, Julius F., 252,324, Cl. D12-55.000.
Ochwat, Robert J. Sleeping bag. 252,308, 7-10-79, Cl. D6-268.000.
Okano, Masao, to Toyo Valve Co., Ltd. Valve handle. 252,339, 7-10-79, Cl. D23-30.000.
Okano, Masao, to Toyo Valve Co., Ltd. Valve handle. 252,340, 7-10-79, Cl. D23-30.000.
Oneida Ltd.: *See*—
Richmond, Colin B., II, 252,314, Cl. D7-37.000.
Parker, William E.; Parker, William E., Jr.; and Hawkins, Larry D. Biblical game board. 252,344, 7-10-79, Cl. D21-22.000.
Parker, William E., Jr.: *See*—
Parker, William E.; Parker, William E., Jr.; and Hawkins, Larry D., 252,344, Cl. D21-22.000.
Persky, Warren E., to Item House, Inc. Jewelry caddy. 252,302, 7-10-79, Cl. D6-157.000.
Persky, Warren E., to Item House, Inc. Jewelry caddy. 252,303, 7-10-79, Cl. D6-157.000.
Prussi, Graziano, to Moneta S.p.A. Decorated cooking pot or similar article. 252,311, 7-10-79, Cl. D7-97.000.
Pryor, John W. Mobile intravenous stand. 252,300, 7-10-79, Cl. D6-28.000.
Rachengold-Werk Adolf Speck: *See*—
Marshall, Simeon, 252,299, Cl. D6-23.000.
Richmond, Colin B., II, to Oneida Ltd. Spoon or similar article. 252,314, 7-10-79, Cl. D7-37.000.
Ryder International Corporation: *See*—
Thomas, Michael D., 252,341, Cl. D24-29.000.
Schaefer, Harold W., to National Union Electric Corporation. Wide track vacuum cleaner housing. 252,332, 7-10-79, Cl. D15-53.000.
Schwartz, Michel, to Miramar of California. Dinnerware set. 252,309, 7-10-79, Cl. D7-3.000.
Shannon, Marvin B. Plastic cup holder. 252,310, 7-10-79, Cl. D7-70.000.
Shirashoji, Hisashi, to Dunlop Limited. Tire. 252,327, 7-10-79, Cl. D12-142.000.
Skinner, Clifton D. Kitchen faucet. 252,338, 7-10-79, Cl. D23-23.000.
Small, Donald I. Desk top file. 252,334, 7-10-79, Cl. D19-90.000.
S.A. Ets Lardenois: *See*—
Baudon, Maurice C., 252,298, Cl. D4-35.000.
Solheim, John S. Skateboard. 252,346, 7-10-79, Cl. D21-227.000.
Solheim, John S. Skateboard. 252,347, 7-10-79, Cl. D21-227.000.
Thomas, Michael D., to Ryder International Corporation. Testing tray. 252,341, 7-10-79, Cl. D24-29.000.
Toyo Valve Co., Ltd.: *See*—
Okano, Masao, 252,339, Cl. D23-30.000.
Okano, Masao, 252,340, Cl. D23-30.000.
Uber, Robert N. Gaming pouch for Keno or the like. 252,355, 7-10-79, Cl. D3-48.000.
Uyeda, Tim M., to Flambeau Products Corporation. Battery box. 252,354, 7-10-79, Cl. D3-30.000.
Vinas, Lorenzo C., to Comercial Exportadora Banolense S.A. Slipper. 252,297, 7-10-79, Cl. D2-300.000.
Waters, Phillip A., to Amerock Corporation. Display unit. 252,305, 7-10-79, Cl. D6-181.000.
Zyliss Zysset AG: *See*—
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NOTE.—First number, class; second number, subclass; third number, patent number

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661	4,160,397
865	4,160,398

CLASS 84

1.03	4,160,399
1.13	4,160,400
1.16	4,160,401
1.24	4,160,402
1.26	4,160,404

CLASS 89

7	4,160,405

CLASS 91

483	4,160,403

CLASS 93

36.3	4,160,406

CLASS 96

1 PC	4,160,666
1.5 R	4,160,667
1.8	4,160,668
27 E	4,160,669
91 D	4,160,671
119 R	4,160,670

CLASS 98

115 R	4,160,407

CLASS 99

348	4,160,408

CLASS 100

257	4,160,409

CLASS 101

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20	4,160,412
24 HC	4,160,413
65.2	4,160,414
214	4,160,415
215	4,160,416
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45	4,160,673
89	4,160,674

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121.12	4,160,423
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6.1	4,160,425

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CLASS 119

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75 B	4,160,430
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	4,160,432
124 R	4,160,433
140 FG	4,160,434
148 CC	4,160,435
190 B	4,160,436

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140	4,160,442
270	4,160,443
271	4,160,444
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CLASS 127

46 A	4,160,675

CLASS 128

1 R	4,160,446
152	4,160,449
214.4	4,160,450
	4,160,451
260	4,160,452
330	4,160,453
348	4,160,454
400	4,160,455
673	4,160,448
735	4,160,447

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337	4,160,461
529	4,160,462
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97	4,160,465
115	4,160,466

CLASS 139

33	4,160,467
453	4,160,468

CLASS 140

115	4,160,469

CLASS 144

3 B	4,160,470
176	4,160,471
194	4,160,472

CLASS 148

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171	4,160,682
187	4,160,683

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0.5	4,160,473

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219	4,160,685
331	4,160,686
444	4,160,687
574	4,160,688
583.1	4,160,689
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664	4,160,691

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256	4,160,694

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272	4,160,481
284	4,160,482
307	4,160,483
317	4,160,484

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CLASS 173

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111 R	4,160,882
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CLASS 198

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632	4,160,501

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308	4,160,890

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195 R	4,160,714
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543	4,160,897

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DESIGN PATENTS

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04 : 252,347
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05 : 252,316
06 : 252,296
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252,314
252,319
39 : 252,322
252,337
42 : 252,342
47 : 252,344
48 : 252,302
252,303
252,310

PLANT PATENTS

6 : 4,435
06 : 4,436
42 : 4,434

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